The Chemical Age

A Weekly Journal Devoted to Industrial & Engineering Chemistry

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Contents

Index to Advertisers, see page iii.

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Other communications relating to advertisements or general matters should be addressed to the Manager.

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Mr. Gray's Progressive Policy

MORE than once we have referred with satisfaction to the stimulating influence of Mr. John Gray on the work of the Society of Chemical Industry. Little is heard of the President's movements, but the current issue of the Society's excellent *Journal* bears witness to the tonic effects of his " commercial fresh air." The Council, it is announced, recently approved a scheme prepared by Mr. Gray, for the appointment of a number of small standing committees with the object of facilitating as much as possible the work of the Council, and with a view to providing an appropriate series of such committees appointed annually to which matters requiring special consideration could be remitted. These committees will report to the Council on all matters remitted to them, and will also submit for the consideration of Council questions and recommendations bearing on the subjects with which they are particularly concerned. Each committee is empowered to appoint such sub-committees as may be thought desirable for the consideration of specific subjects, and may co-opt a number of members of the Society whose special knowledge or experience it may be considered desirable to benefit by in connection with any matter under discussion. These committees will deal with the subjects of finance, general purposes, publications, transactions and abstracts, review annual reports, literary and library matters, Government and Parliamentary questions, and technical, research and allied societies.

The finance committee was initiated about two years since on the suggestion of Professor Henry Louis (who was then President) in order that matters of finance might be considered and reported on before being brought under the consideration of the Council. Since its inception it has been under the chairmanship of Dr. C. C. Carpenter, and its work has been of great service to the Council, and has saved much time at Council meetings. The general purposes committee is at present engaged on the revision of the Society's by-laws, and has also under consideration a number of other matters of immediate importance to the members of the Society. The publications committee deals with general questions of policy relating to the Society's publications; under it are three sub-committees, dealing respectively with the transactions and abstracts, the review and the annual reports. The literary and libraries committee has at present under its care the organisation of the Society's books and periodicals, and also the very complete catalogue of chemical journals in the various libraries throughout the country which has been prepared by Dr. A. Holt, of Liverpool. The Government and Parliamentary committee deals with Parliamentary bills, Government orders and similar matters. The technical research and allied societies committee nominates for the approval of Council representatives of the Society on outside bodies; it also deals with matters in which co-operation with allied societies is desirable, and with research work carried out under the auspices of the Society. Finally, the emergency committee has been set up to deal with matters of extreme urgency; it consists of the conveners of six committees, and is convened by the general secretary. The new arrangement should help the Council to deal more effectively with its responsible, extremely varied, and constantly increasing duties, and in the degree in which it serves this purpose will add to the stability and influence of the Society.

Lord Moulton on Chemical Engineering

WHILE Lord Moulton in his address at University College, London, last week did not propound any new theory of the functions and training of the chemical engineer, he usefully reminded us of the distinction of his office from that of the chemist and of some of the essential conditions of success. Three, at least, of these points cannot be kept too constantly in mind. There is first of all the distinction that, while the laboratory chemist is dealing with small quantities with carefully chosen apparatus under his immediate control, the chemical engineer has to apply the same processes on a much larger scale and under conditions of control which leave a far wider margin for miscalculation on his own part, and for negligence by others on whom he must rely. It follows, therefore, that the chemical engineer must not only know all that the pure chemist has discovered in the laboratory, but supplement this scientific knowledge by a large capacity for application and direction. The chemist himself may be hopeless from the business point of view; in fact, the type of mentality that most perfectly suits the slow and patient processes of research is generally the one most destitute of the qualities of bold calculation and initiative. In short, the chemist is largely the theorist; the chemical engineer has not only to know the theory but to be able to work it out on a commercial scale.

Lastly, the chemical engineer, in addition to his mastery of the principles of the related sciences of chemistry and engineering, must be a practical business man, capable of thinking out his plans in the terms of a balance-sheet. In this respect he may become one of the most potent influences on the course of industry, for, as Lord Moulton pointed out, the discovery of a cheaper and more prolific process of production of some necessary of existence may not only bring dividends to the company, but fundamentally change the conditions of life for all and beneficially affect the whole order of civilisation. It is here, admittedly, where the Germans have excelled us in foresight and enterprise. Not content as we have been disposed to be to allow laboratory results to remain laboratory results and nothing more, they have carried them into the works, spent large sums on experiments for turning them to industrial account, and in most cases obtained the commercial reward. It is becoming rather a habit in this country to say we have no chemical engineers. No one, of course, accepts that literally. It is, however, certain—the recent organisation of a chemical engineering group is a sufficient admission of the fact—that chemical engineering has received in the past less attention than it deserved. That defect is now in process of being corrected, and British chemical industry promises to gain enormously in the future by adequate recognition of the functions and more liberal provision for the training of the chemical engineer.

The Condition of Germany

THE militarist "revolution" in Germany, if it attains any serious proportions, may prove to be far more than a purely domestic problem in German politics. It is for the collective good of Europe that the defeated nations should speedily recover their normal social order and industrial and commercial organisation, and the example of Germany, one way or the other, may prove the decisive factor. A national collapse would be a disaster, in which other nations would be involved; on the other hand, recognition of the fact of defeat and a typical German effort at self-recovery would set an excellent example throughout Europe. British chemical industry cannot look on unconcerned at the new developments. The reports of the great difficulties with which German chemical industry is struggling—shortage of coal, the demands of labour, the unprecedented depression of the rate of exchange, and a general lack of raw materials—may be viewed by the British manufacturer and merchant with comparative composure. These factors give us the chance, if we care to exert ourselves, of eliminating some part at least of the heavy handicap represented by their forty years of chemical activity. But if Germany becomes really rent and demoralised, its example is bound to have a disquieting influence on other nations, and to retard the process of reconstruction in Europe.

On this point it may be appropriate to recall the impressions of a British chemical merchant, fresh from an extended tour of the unoccupied provinces, published in THE CHEMICAL AGE of February 7. "If," he stated, "Germany goes down economically, other European nations may follow, and we shall undoubtedly feel the effect. We have, therefore, to think not so much of the bogey of cheap German competition, which for some years to come may be put out of the question, as of the danger of a too complete collapse, which may re-act seriously on this country. The best thing for the immediate future would be to help Germany—up to a certain point, at any rate—towards a moderate recovery. I do not, of course, put this on moral grounds; I am thinking of the matter from the purely commercial and economic point of view. We have nothing to fear from German competition, but we may have something to fear from a German economic break up; and in my opinion we shall best be safeguarding ourselves by helping to save Germany from that final catastrophe." This view is based on good information, and is one to be kept in mind in any consideration of the present German crisis. Our latest information from those who are closely in touch with German chemical industry is that the position is really grave—so grave, that if the sinister influences which are at work prevail over the saner elements of the population, the end of the revolution may be a Bolshevist regime.

Dyestuffs Manufacture

WE are glad to find the views expressed in THE CHEMICAL AGE on the position of the British dyestuffs industry confirmed by Mr. J. B. Shaw in his Paper before the Oil and Colour Chemists' Association on the manufacture and use of dyes. The progress made since 1914 in this country Mr. Shaw describes as a "miracle," and he claims that what the British dye manufacturers have accomplished could not have been accomplished by any other nation in the world. This is high praise, but not more, we think, than the facts, if they could be fully disclosed, would justify. On another point Mr. Shaw agrees with views expressed recently in these columns. He does not see any immediate prospect of the necessary intermediates becoming available to enable pigment manufacturers

to produce their own colours. One sufficient reason is that British manufacturers have not enough for their own requirements, and pigment makers will have to exercise even greater patience than they have hitherto done before their hopes are realised. The satisfactory point for the moment is that progress is being made along the right lines—not, it is true, at the impossible rate demanded by critics, but at a distinctly encouraging pace. Among the instances quoted was that of Lithol Red R, or Monolite Red R, as it is called by the British Dyestuffs Corporation. This, according to Mr. Shaw, is the first achievement of British dye makers, who are to be congratulated on having produced a colour as good as the pre-war product. The present sustained organisation and effort contrast promisingly with the position before the war, when lake chemists—in common, indeed, with most classes of chemists—were lacking in initiative and were too much given to relying on German dye manufacturers for information respecting colours for lakes. The trade, he says frankly, was spoon-fed. That description applies pretty generally to British trades. Whatever we could get elsewhere without the trouble of making it ourselves we got from other nations. That worked admirably until the war forced us to realise the perils of a too complete dependence for necessaries on outside sources, and unless we are promptly to forget all the lessons of the war and relapse into the old position, there is nothing to do but to proceed patiently, as the British dye industry is doing, with the organisation required for ultimately supplying all our own needs.

Molybdenum in Canada

THE majority of our readers will remember the prominence which was given some few weeks ago in the Press to the discoveries of Dr. Arnold, of Sheffield, in connection with the manufacture of a molybdenum steel. The production of high quality self-hardening steels is of considerable importance, and Dr. Arnold's work should do much to enhance the reputation which this country holds for steelware. Some of us may, perhaps, have felt a little sceptical as to where large quantities of molybdenum were to be obtained; but any doubts in this respect have been allayed by the facts which have recently been given by Mr. A. W. G. Wilson, of the Canadian Department of Mines. The resources of Canada in the way of molybdenite appear to be almost without limit, for already over a hundred distinct deposits have been located, and many of these have so far not been tapped. Up to the present the world's consumption of this element has been comparatively small, amounting to some 600 tons per annum to which Canada has contributed about 200 tons. If, however, molybdenum comes to replace tungsten in the manufacture of special steels a vastly greater output will be required.

Mr. Wilson points out that the development of the molybdenum industry depends in a large measure upon the success with which the world's steel manufacturers meet in procuring supplies, and it may be reassuring for them to know that Canadian producers are only too anxious to obtain a regular market for their material, as it is the uncertainty of the demand which has proved the main disturbing factor in the past. The producers, in fact, are ready to enter into any reasonable contracts, and they are in a position to guarantee that their contracts will be duly fulfilled. As regards cost, it may be noted that, once freightage rates begin to fall, it will be possible to obtain Canadian molybdenum at lower rates than it can be produced in the present European plants. At the moment, perhaps, the feeling in the steel industry is that considerable further research must be undertaken before molybdenum steels are turned to general commercial account. For all that, there is no question of their having passed the experimental stage as their wartime applications have shown. The United States employed this type of steel in the manufacture of crankshafts and connecting-rods of the famous Liberty engines, while the Ford Motor Company succeeded in producing a comparatively thin armour plate containing 1 per cent. of molybdenum which readily conformed to the tests required by the regulations of the U.S. War Department.

The Calendar

Mar.		
23	Faraday Society: "Basic Slags: Their Production and Utilisation in Agricultural and other Industries." General Discussion. 7.30 p.m.	Chemical Society, Burlington House, Piccadilly, London
23	Manchester Municipal College of Technology: "Electrolytic Chlorine and Chlorinating Plant." Third Lecture. J. B. C. Kershaw. 4.30 p.m.	Manchester.
23	Sheffield Association of Metallurgists & Metallurgical Chemists: "Ochre Waters." John Evans and John Haworth.	Sheffield.
23	Royal Photographic Society of Great Britain (Technical meeting): "Factorial and Time Methods of Development Applied to Bromide and Gaslight Papers." Dr. Bertram Glover 7. p.m.	35, Russell Square, London.
25	Society of Chemical Industry (Birmingham and Midland Section): Annual meeting. "An Apparatus for Estimating CO_2," by Dr. A. Slator. 7 p.m.	University Buildings Birmingham.
25	Society of Chemical Industry (Manchester Section): "Non-Ferrous Metals Used in Chemical Plant," by E. L. Rhead. 7 p.m.	Manchester Literary and Philosophical Society, 36, George Street, Manchester.
25	Society of Dyers and Colourists (Bradford Junior Branch): "Utility of General Science to the Dyer." Dr. L. L. Lloyd.	Halifax.
25	Society of Dyers and Colourists (West Riding Section): "The Progress of Solvent Scouring." Harry Hey.	Bradford.
25	Royal Society. 4.30 p.m.	Burlington House, Piccadilly, London.
25	Chemical Society: Annual General Meeting. Presidential Address by Sir James Dobbie. 5 p.m. Informal Meeting, 8 p.m.	Burlington House, Piccadilly, London.
26	Royal Institution of Great Britain: "The Scientific Work of the late Lord Rayleigh." Professor Sir J. J. Thomson. 9 p.m.	21, Albemarle Street, London.
27	Chemical Industry Club: "Chemists and Whitley Councils." General Discussion.	2, Whitehall Court, London.

The Fine Chemical Trade: Where Are We?

By a Small Manufacturer

II.—Deductions

ACCEPTING the outline of the present position in the English Fine Chemical Trade in my last article as substantially correct, one must deduce therefrom certain conclusions before suggesting a remedy, if a remedy be possible. It will be simpler, perhaps, to arrive at those deductions by means of certain frank queries and equally frank answers thereto.

Does the present position of the Fine Chemical Trade mean that those engaged in it are incapable of meeting the situation? If the answer is emphatically in the affirmative then there is no more to say, and the quicker the inevitable return to old conditions comes the better. I believe the answer is in the negative. We know the men engaged and the ability that is spread throughout the trade. We know that the British manufacturer can rise to the occasion. He did it during the war—nobly and well. He can do it during peace. If then it is not a question of incapability, what is it? It may be one, or more than one, or all of the following reasons:—

1. Lack of capital.
2. Lack of organisation.
3. Lack of co-operation.
4. The effect of outside troubles—labour difficulties, high wages, high cost of everything, transport, and the call for protection.
5. The deadening effect of national idiosyncrasies, such as insularity, pride, unsociability, independence in its wrong form, accentuated individuality, or just "sheer cussedness."

The Question of Capital

Taking these reasons as far as possible seriatim there is no doubt that the lack of adequate capital is a very big factor. I do not mean that the individual firms of any size are working on insufficient capital, but that there is not sufficient total capital involved for the trade that can be done. The total capital employed, small as it is, is badly distributed, consequently the establishment charges and unproductive capital locked up are, from the point of view of the trade generally, immensely out of proportion. This is due, of course, to overlapping. It is not possible, nor perhaps desirable, that only one firm should manufacture a given line, but it will be found on examination that the number engaged on many lines is far larger than need be, and that, therefore, production must necessarily be more costly than it should be. It was hoped that some means would be found through the various societies and associations to overcome this overlapping. The essential fact is that those means have not been found. Another effect of this state of things is that whereas many lines are overproduced, others equally necessary are almost untouched. In either case even in the home markets foreign competition slips in between us, and in the foreign markets there is very little hope. The lack of capital, therefore, or at any rate the misuse of much of the capital in existence, must be reckoned with as an important factor, but by no means one which cannot be overcome. It is in no sense an insuperable difficulty.

Organisation and Co-operation

The lack of organisation of the trade generally is a much more vital factor because it is not so easily overcome. I am not saying for a moment that in the individual factory the organisation is necessarily bad. Many of the factories are well conducted, and within the limits of the capital employed well organised. It is the lack of organisation of the trade generally which is so deplorably lacking. There has been recently presented to the Chemical Industry Club a chart showing the manner in which the German factories were linked up for mutual trade. This chart was published in THE CHEMICAL AGE on January 10 last. It is not my business now to discuss the obvious advantages of this method of unified operations. I merely wish to point out that we have no such open arrangement here, nor is there any indication that those to whom we should all look to pave the way are even contemplating doing so. That there is co-operation in some lines between certain firms we all know; but that is the formation of rings, and not the basis of national organisation. If our most important fine chemical manufacturers will not give us the lead and open the way to a national unity, to whom are we to look? Must such a scheme necessarily destroy the independence we all love so much? Is the individuality we all work for and long for, and which is our boasted inheritance, so foolishly blind that it cannot see clearly? We know how it was done, we have the means to do it, but we cannot or will not trust each other sufficiently to believe it possible. There can be no doubt, look at it how you will, that there lies the main disease from which the trade is suffering. As a trade we are disorganised, an army without a leader, without unity, almost without design.

And the next reason—lack of co-operation, is part and parcel of the trouble. I am reminded of Tom Pinch when he was looking for work through advertisements. He noticed how extraordinary a thing it was that someone wanting one thing and someone else having the identical article, always appeared to advertise in the same paper and yet never to come together. The same thing is happening all over the trade. A. wants raw materials which B. has, to manufacture products which B. requires, but A. and B. never seem to come together. A. may produce a by-product which because he cannot sell he puts down the drain; and yet C. cannot get enough of it. Again, D. is a merchant and wants so many tons of a certain product per week. He has orders for it, he will place orders for it, he will even find capital or raw materials or both for the manufacture of it; but E, who is making hundredweights a week, only never seems to get in touch with D. And F., who is a chemist, has a 'process which is good ready for development. G. wants a process, has the capital and the works and the capacity. But F. and G. never meet, except by a fortunate chance, and F. remains a poorly-paid chemist, and America supplies the goods. The pity of it!

Other Factors in True Perspective

The reasons which I have indicated under numbers 4 and 5 play their part perhaps, but how much smaller a part would they play if other things were equal. And who will say that high wages play so vastly important a part in the Fine Chemical Trade? There is hardly any trade in which the labour bill in comparison with the value of the products is on the whole so small. I know one firm whose turnover is in the neighbourhood of £40,000 per annum, whose wage bill is little more than £100 per week. I have in mind a process in which the value of the product is 3s. 6d. per lb., the cost 2s. per lb., and the labour 3·5 per cent. of the cost. Such a happy state of things does not exist in every process I know, but on the whole it is safe to say that in the manufacture of fine chemicals the cost of labour is not the ruling disability. Labour troubles, high cost of raw materials, shortage of raw materials and transport all play their part, but not an overwhelming or strangling part. We have clamoured and are clamouring as a trade for protection. We have had it for five years and what have we done? Let us at any rate be honest with ourselves in this matter. I have no objection whatever to seeing a protective tariff enforced in favour of fine chemicals. It would be a very nice thing for the manufacturer, but would it establish the industry any more securely if protection and that only were established? I do not believe any honest fine chemical manufacturer would say "Yes" to that question.

We have now, and have had ever since peace, practically a free field in our home market. There has been little or no outside competition, and yet we are not within reasonable distance of satisfying it. The strange part of the whole question is that talk to whom you will, manufacturer large or small, merchant or chemist, you will hear the same admissions and the same regrets which, being interpreted and summed up, are tantamount to what I have endeavoured to say here. In addition you will hear something said about alcohol and other restrictions, lack of Government support, and more often some sort of wail that the trade is not getting on, and that things are by no means right with us inwardly or outwardly; that is, with everyone else except our individual selves.

There are difficulties; who can deny it? But when they are all boiled down and we have made due allowance for our insular peculiarities, for the difficulties that beset us, and for the other things, let us at least make no mistake about the final diagnosis of our case.

Government Support and Restrictions

I do not believe that the present position of the fine chemical trade here is due entirely either to lack of Government support,

alcohol restrictions or similar disabilities, high wages, general trade difficulties, high prices, or even to our peculiarities as a nation, or the very peculiar peculiarities of our trade and its sister profession. These are contributory causes but minor ones.

I feel convinced that the right and only sound deduction that can be drawn from the examination of the present position of the fine chemical trade is that the principal and most deadly difficulty is the lack of co-operation. It prevents the trade being properly recognised in Government circles and having sufficient weight in the political matters which affect it. It prevents the proper recognition of the chemist. It prevents his proper employment and remuneration. It causes waste untold. It fosters unnecessary internal competition. It prevents the best attack being made on the markets of the world. It increases costs. It decreases output. It reduces the number of possible lines. It duplicates and wastes plant. It puts capital out of commission. It stultifies effort. It invites the competition of the world in our own markets. It makes for secrecy, the formation of petty rings for single lines, and distrust. It makes us try to compete against the world individually instead of collectively. It is absurd.

We must confess the fact. We are a trade leaderless; whose right hand knoweth not what its left hand doeth, and whose head careth not for it has a well-fed body. It sometimes "sits and thinks and sometimes just sits."

Review

LABORATORY MANUAL OF ELEMENTARY COLLOID CHEMISTRY. By Emil Hatschek. With 20 illustrations. London: J. & A. Churchill, 1920. Pp. viii.+135. 6s. 6d. net.

Although the study of the properties of the colloidal state has been actively pursued by a number of chemists and physicists in this and other countries during the past fifteen years, and although a considerable literature has already grown up round this subject, the attention which it has so far received in our universities and colleges has hitherto been comparatively slight. Almost suddenly, however, the scientific and technological world has wakened up to the importance of the colloidal state in the domain both of pure science and of technology; and although, in the latter sphere, scientific theory lags behind industrial practice, the recognition of the importance of the colloidal state of matter will, it may confidently be hoped, lead to a more scientific investigation and control of many processes in which colloidal matter is of pre-eminent importance. All the more reason, therefore, that in the training of our chemists, colloid chemistry should receive its due share of attention and that some opportunity should be given to our students of chemistry of making themselves acquainted practically with the properties of colloidal matter and with the methods of investigation employed in this branch of the subject.

For this reason we may give a hearty welcome to the small laboratory manual by Mr. Hatschek, whose aim in the present work is "to supply accurate and very detailed directions for carrying out the fundamental operations, for making a number of representative preparations, and for examining them by standard methods. These are based throughout on personal experience of the processes described and of the difficulties experienced in teaching them." The author is eminently well qualified for this work, and has produced a book which will be found of much value in connection with special courses on colloid chemistry or even in the general course of training in physical chemistry. The author has been well-advised in keeping the book at first within a very moderate compass, but it may be expected that in no great period of time a larger scope will with advantage, be given to the work. Meanwhile the references to literature which are added at the end of most of the chapters will be found very useful to those who wish to extend their acquaintance with the subject. After a general chapter the author deals with dialysis, suspensoid sols, suspensions, organosols, emulsoid sols and gels, egg albumin sol, emulsions, ultra-filtration, optical methods of examination, cataphoresis, electrolyte precipitation of suspensoid sols, mutual precipitation of suspensoid sols, protection, viscosity measurements, adsorption (qualitative experiments) capillary analysis, determination of an adsorption isotherm, the Liesegang phenomenon. The book is to be recommended for use in all laboratories.

A. F.

American Chemical Notes

(FROM AN AMERICAN CORRESPONDENT.)

THERE has been considerable activity in nearly all lines of the organic chemical industry during the past year. A gradual elimination of many of the smaller companies engaged in the manufacture of pharmaceutical products, such as salicylic acid, aspir[illegible] &c., has taken place, in consequence of which the entire in[illegible]y is now on a much sounder footing. Certain of the larg[illegible]mpanies have developed the manufacture of such pro[illegible] on a considerable scale, and have apparently brought [illegible]heir operating costs to a satisfactory level. This is true w[illegible] regard to such materials as phthalic acid, salicylic acid, benzyl chloride, bensoic acid, &c., in regard to which valuable new ideas and technique have been developed. Important advances have been made in reducing the cost of the manufacture of phthalic anhydride by the catalytic oxidation of naphthalene in the vapour stage, and the same method has been applied with success to the manufacture of maleic acid, quinone and hydroquinone from benzol.

The constantly increasing demand for gasoline has brought about a rapid increase in the price of benzol, due to the use of this latter material for automobile purposes. America is now actually a large importer of crude petroleum, and, with the certainty of a still further increased demand, Government attention has been drawn to the extensive shale deposits in Utah and Colorado, and the creation of an experimental station for the examination of this has been decided upon.

The use of ethylene for welding and cutting has been introduced into the trade, and a considerable use for the same is predicted.

It is understood that the recent action of the Senate Committee recommends protection for the American dye industry in the form of an embargo on all dyestuffs at present manufactured in sufficient quantity, whilst granting permission to import, during the next six months, those not already produced. It is anticipated that it will take another two months before the necessary legislation is enacted.

A considerable number of poison cases, due to the indulgence in "spirits" containing wood alcohol has resulted in certain drastic measures for the protection of the public, and an appropriation of $3,000,000 is called for by the Government to ensure the effective carrying out of the Prohibition Enactment.

The future of the chemical warfare service is still undecided. Attempts to have it made part of the Engineering, and later of the Ordnance, branch of the service, although backed by the Government, have been strongly opposed by the representatives of the chemical profession, and the prospect of its continuation as a separate branch now seems more favourable.

The sum of $5,000,000 has been placed at the disposal of the National Research Council and the National Academy of Science by the Carnegie Corporation of New York. It is hoped that concrete results will ensue from the application of these funds to the promotion of technical and scientific research. Some disappointment has been expressed at the apparent slowness with which the Council is proceeding.

Owing to the severe wintry weather, attention has been drawn to the necessity for a non-freezing liquid for automobile radiators. It is claimed that glycerine is unsuitable owing to its tendency to "gum," whilst solutions of calcium chloride are not in favour on account of the possibility of electrolytic action. Considerable use has been made of high boiling petroleum oil, the water in the radiator being replaced entirely by this material; but an increase in the fire danger apparently prevents its more general adoption.

An interesting communication was read at the last meeting of the New York section of the Electrochemical Society by Dr. W. S. Landis, chemical director of the American Cyanamid Company, on a new process for the manufacture of sodium cyanide from cyanamid. The product contains about 36 per cent. sodium cyanide, the balance representing principally common salt. It is apparently finding extensive employment in the mining and other industries, the claim being made that, on account of the lower cost of production, it can more than compete with the older processes. The fundamental principles involved are not new; but, if the claims made should prove to be well founded, it would seem that Dr. Landis is to be congratulated on having brought the commercial development to a successful conclusion.

The Chemical Engineer

Lord Moulton on his Training and Functions

The formal inspection on Wednesday week of the new laboratories at University College, London, by Prince Arthur of Connaught was followed, as we briefly announced last week, by an address by Lord Moulton on " The Training and Functions of the Chemical Engineer." In introducing the lecturer Prince Arthur said that Lord Moulton had devoted his great scientific and legal attainments in the service of the country as Director-General of the High Explosives Committee. How exacting those duties had been he knew full well, and the result of the war afforded ample evidence of the efficiency with which they had been carried out. Lord Moulton had only just been released from his duties, and was now able to return to his work in the House of Lords as one of his Majesty's judges.

Lord Moulton reminded the audience of our position at the outbreak of war, and said it was not the lack of chemistry that gave us anxious hearts ; it was the fact that in Germany the results of chemical research had been applied in practice, and that the chemical engineer knew his business. He had put up plant which was necessary for production, and the results of chemistry were not merely knowledge, but knowledge applied in practice. As the war went on, and we drove our foes to greater and greater straits in the way of obtaining the necessary material for civil and miltary life, it was chemical engineering which enabled them again and again to find substitutes in the production of those necessities. We had to admit our shortcomings when we found ourselves short of things essential and of the industries which must produce them.

Chemist and Chemical Engineers

The chemist as opposed to the chemical engineer reminded him of the difference between the mathematician and the mechanical engineer. The mathematician figured out his calculations, and his plans did not wear out. The mechanical engineer, on the other hand, worked with materials that did wear out. When the chemist became a chemical engineer he stepped from the ideal into the material world. His methods were practical, and he found himself forced to follow in the steps of the great chemists without their advantages, yet bound to obtain their success. The chemical engineer worked for production on a scale that the needs of mankind demanded and he therefore abandoned the scale of the laboratory. Change of scale was more important than people imagined. It seemed very little different to work with bigger plant, and to deal with more substance than to deal with the same substance on a smaller scale. But just because it seemed not to make so great a difference change of scale was more likely to lead clever men into trouble than almost any change of conditions one could think of. Change of scale was a very difficult thing to allow for, but it was the secret of successful chemical engineering.

As an illustration of the expense which change of scale involved, and the reason he put it down as the great characteristic of chemical engineering as contrasted with research chemistry, Lord Moulton said he once knew the head of a great engineering business in the North of England who prided himself on having cooked an ox whole so that it was well cooked in every part. Many people could cook a joint, but he doubted whether any of the professors at the college would undertake to cook an ox whole, and have every part we'l cooked. There they had the chemical engineer. But that was not the only task which confronted him when he stepped into the real world. Instead of a few grammes of a substance he had to deal in hundredweights or tons. He had to put them through the same processes as the small amounts dealt with by the chemist, but the chemist could regulate everything so that he could determine the exact conditions which were necessary for success. In a chemical process the molecules were being perpetually tempted in all directions, and he who could separate the good things from the bad of the molecules was the one who succeeded. When they came to the large masses dealt with in chemical engineering, and they were told that the temperature must be at a certain level, and that they had to maintain a certain pressure, all sorts of problems arose. This change of scale brought into the task of the chemical engineer some very difficult problems, for he had to see that everywhere the right conditions ruled. Whenever Lord Moulton had seen chemical engineering on the scale at which it had to be done to satisfy our wants, it had impressed him that things one never dreamed of as being important became serious considerations when dealing with large masses.

Cheapness of Production

The dominant considerations in production ought to be efficiency and cheapness. Cheapness, which implied that they had got the same result with less human labour, and therefore had enabled the world to get what it wanted with less burden to itself, was not only important, but it was the motive and the guide in which all chemical engineers ought to take a pride. He could never understand the lordly contempt with which many people regarded the cheapening of an article. Every time they made an article cheaper they enlarged the number of people who could enjoy that article. Less machines put less into the hands of the poor people, and, therefore, when chemical engineering took as its dominant consideration economy of production it recognised a law of which it ought to be proud. If chemical engineering was to live it must do its work economically. The chemical engineer had stepped into real life—the life of competition. He had no longer to consider what was best for the success of what he was doing, but that which was best considering its cost. He had to look round and see what existing materials there were. He had to get to work on those, and not stand wishing they were pure. In nothing had the Germans impressed him so much as in the way they had devoted themselves to that which they had found at hand, and had used their experience to make those substitutes do while we were dealing with far more expensive materials. The chemical engineer had to use what was at hand, and to use it in the most economical way. He had to consider what processes were best to obtain the substances he wanted. He had to look round and see the best possible forms of plant, and to resolve which would work out best in the circumstances of large manufacture.

Choice of Plant

The choice of plant was no easy thing, and it was made more difficult by the success of those who had devoted themselves to the designing of chemical engineering plant. They had a choice of so many ways of doing each thing. The chemical engineer had the choice of all sorts of ways of filtering, and his success, as contrasted with that of his competitors, depended on his having made the choice which would best suit the peculiarities of the substance in which he was working and the stage to which they would have to be filtered. All these questions of plant were problems with which the chemical engineer was faced. Most important of all was the budget which he had to make out. He had to consider how best, how most cheaply to attain his object, and he therefore had to consider what by-products he could get, how far it was possible for him to neglect these for the sake of what he was mainly striving to get. That was not all. Taking the case of heat, Lord Moulton said that it was too precious to be wasted. It might be that the process that he was carrying on needed no heat, or, if it did, perhaps, it would give back that heat, with an added amount, at some later stage because the action itself gave heat, and he could not waste it. The actual amount of a substance which would have to be put in had to be calculated by the engineer if he was to do his work efficiently, and he had to calculate the speed at which it would go in or come out. He must find out if it was to pass through other substances, and see that the temperature was right. All that brought in what was a *sine qua non* in chemical engineering. No man was worth his position as a chemical engineer who could not calculate all these things as to heat conditions. Therefore, the dominant consideration of effective production governed the whole problem of chemical engineering. After the chemist had told him all he knows there were still great problems in which his own experience alone could guide him. There was no inferiority in his task as compared with that of the research chemist.

Neglect of Chemical Engineering

In past years England had neglected chemical engineering. How short we were in the beginning of the war ! How short we still were ! They were determined that all that should cease, and he wanted them, keeping in mind what the task of the chemical engineer was, to follow him when he thought of his training. First of all, he must have a good knowledge of chemistry, for after all it was chemistry which inspired him. No doubt he could have that to a large extent in the company of those who were working to be pure chemists, but he did not want what they wanted. He wanted a sound knowledge of the chemistry that he took up, and, above all, one that made him realise the nature of the actions which went on in the more simple processes. He could easily make himself acquainted with any special task that he took up, but the one thing he must get was the realisation of the best of chemistry, which would enable him to think clearly on whatever subject he took up.

Above all, he must be taught to as great an extent as possible the great learning which had been obtained in the last half-century on physical chemistry. To him it would be more important to master the behaviour of objects through a large range than to learn a few interesting and valuable reactions which had been discovered when new substances had been made. He wanted to know how substances behaved under changes of temperature, how their properties would serve him as he used them. He had to handle these substances for himself. He wanted to know how his vast masses could be got in order and made to do what he wanted, and it was necessary for him to know the objects with which he was dealing through and through. He must know what these properties were which he could utilise for his own purposes, for he was not dealing with merely chemical properties now.

Lord Moulton told them of an experience of his own in connection with munition work during the war, where the whole method of a process turned on the behaviour of a substance as it passed through a range of temperature from 0°C. to 100°C., and he added that the chemical engineer himself must know the physical properties of substances thoroughly. It was from them that he might achieve his greatest successes, and save himself from many woeful failures. They could never tell what property of a substance was going to allow them to work their wills upon it. They all knew of the power of attraction given to vulcanite when rubbed by silk, but they would

scarcely believe that that property had been applied by Sir Oliver Lodge to separate minute particles of dust which were a nuisance by reason of their very smallness. The chemical engineer was a true hunter, he knew the ways of his game, and he took advantage of everything which would bring them into his trap. He could give them all sorts of instances where, in similar ways, the physical properties of an object had been made to help them to carry out their processes.

The chemical engineer must see chemical operations going on on a scale which brought in all the difficulties Lord Moulton had been pointing out as arising from the change of scale. He must have separate laboratory accommodation in which he could carry on manufacturing processes on a small scale, and he must learn from that exactly the commercial significance of all that he did. That could only be done in a large laboratory fitted up specially for the chemical engineer. It gave Lord Moulton the greatest satisfaction to see that the Ramsey Memorial Fund was going to contribute £25,000 towards a Ramsey Memorial Laboratory of Chemical Engineering at University College. Without that they could not train the chemical engineer. He thought they would find it would be necessary in the course of his training that they should enable him to follow out real chemical engineering on the gigantic scale on which it was carried out in practice. He must learn to do accurate costing, and he would then see how far he was really doing with a minimum of human labour, and a minimum of cost that which he had set out to do. He would be cured of many of the deceptions which haunted the young. Briefly his task was this: He had to achieve the results, to do all that the chemist would do with the assistance that he got in his laboratory, and secure the same results, although he realised that he had abandoned the aids which gave the chemist his power of attaining success. In spite of all this he had to attain as nearly as possible to the same standard of excellence.

Professor F. G. Donnan, F.R.S., in proposing a vote of thanks to Lord Moulton, said they still required another £50,000 for the purpose of the new chemical laboratories, and he hoped that the manufacturers who were present would come forward with their help. If they did not take chemical engineering seriously no one could say what the future would be. It was the intention to have a building there in which any engineer and chemist could meet and undergo the metamorphosis which might, perhaps, produce a chemical engineer.

New Nitrate Tenders

In their circular just issued Messrs. Thomson, Aikman, Jun., state that the Nitrate Producers' Association announce that they are prepared to sell 100,000 tons of nitrate of soda for shipment in any position up to June 30 at 16s. 9d. per quintal, and, in addition, are open to receive tenders on March 24 for:—

100,000 tons, July delivery, at a minimum price of 16s. 9d. per quintal.

100,000 tons, August delivery, at a minimum price of 17s. per quintal.

50,000 tons, September delivery, at a minimum price of 17s. 2d. per quintal.

50,000 tons, October delivery, at a minimum price of 17s. 4d. per quintal.

50,000 tons, November delivery, at a minimum price of 17s. 6d. per quintal.

50,000 tons, December delivery, at a minimum price of 17s. 6d. per quintal.

Tenders will be opened in Valparaiso and London on March 24.

Nitrate Position in Chile

In a survey of the position of nitrate in Chile for the period July-December, 1919, received from H.M. Consul at Antofagasta, it is stated that the total stocks of nitrate on the Coast on June 30 last amounted to 33,000,000 quintals, and production for the last six months was 16,017,927 quintals, making a total of 49,017,927 quintals. Sales through the Centralisation Committee up to the end of the year amounted to 29,639,500 quintals, thus leaving 19,378,427 quintals available for sale. The greater part of the 29,639,500 quintals sold had not been lifted at the end of 1919, and it is estimated this will not be done until well into April, on account of the scarcity of vessels and other causes. A large number of nitrate factories had either to close down or work at a reduced rate, and the production fell to half of that during 1918.

Due to the aforesaid sales, and also a further recent sale of another 2,000,000 quintals for May-June delivery, producers are viewing the position with sufficient confidence to warrant their increasing the production of those factories already working and re-opening those closed down—the German factories amongst them—and the production for December was 1,000,000 quintals in excess of that of November.

Mr. Harold Jeans announces that he has changed his address from 165, Strand, to Bessemer House, Adelphi, Strand, W.C.2, to which all communications should be sent.

Rotary System of Drilling Oil Wells

Paper before Petroleum Technologists

At a meeting of the Institution of Petroleum Technologists on Tuesday, a Paper on "Plant used in the Rotary System of Drilling Oil Wells" was communicated by Messrs. Maurice A. Ockenden and Ashley Carter.

In their opening remarks the authors pointed to the need for greater co-operation between the geologist and the engineer in the search for petroleum. The uncertainty or risk in drilling wells, especially with the ever-increasing depths, should be an inducement for enterprising engineers and geologists to take greater interest in the exploitation of oil. The object of the driller was to "make hole" as rapidly as possible, while, on the other hand, the geologist desired the fullest information of the formation penetrated.

The art of rotary drilling was young compared with percussion drilling, but it must not be inferred that it was still in the experimental stage. It had frequently been stated that no special skill was required to operate the rotary, the reason being that the drilling tooled cleaned itself, as the drill-stem was lowered into the beds by the mere releasing of the control on the draw-works, particularly when there were no hard strata to be encountered. At the same time, there was still much to be learned.

There was still some confusion amongst British and European engineers in the use of the word "rotary." For many years past *core drills*, used with chilled shot and serrated shoes had been known as the *rotary* system. The unexpected results obtained by the introduction of mud-flush, in place of that with clear water, brought about the general use of rotary tools for drilling through sands, clays and formations of a caving or friable nature. In other words, there resulted a non-coring drill on the core-drill system. Water-well drillers in this country still spoke of their core-drilling equipment as "rotary." It was unwise to use mud-flush in connection with drilling for the supply of water, where the free inflow of water was desired, whereas water must be excluded in drilling for gas or oil.

The authors expressed the opinion that drillers, properly skilled in any system of drilling, particularly hydraulic rotary, should seek experience in various fields, and so acquire a knowledge of more than one geological area. It was reasonable to suppose that, as more men become skilled by varied experience, and expert in the handling of long strings of pipe, both drill pipe and casing, that the hydraulic rotary would be more extensively adopted, either in combination with percussion tools, or as rotary only.

Conclusions

In conclusion, the authors referred to methods of drilling, particularly in regard to the use of mud-fluid. The hydraulic rotary had, perhaps, a greater future as an auxiliary to percussive methods than as an independent system, although there were certain fields where the rotary could be used entirely.

Drilling machinery was designed and built in accordance with the ever-changing requirements of the field, and, as far as possible, taking into consideration an extreme conservative factor of safety. Much of the plant received the minimum of attention, and the duty could not be definitely anticipated.

Consulting engineers, or those responsible for the supply of material, should scrutinise requisitions from the field, not so much to prevent changes being made, but to prevent unnecessary changes in gauges, threads, &c., particularly for material lowered into the bore-hole. The enthusiasm of the driller-engineer for improvements in one unit might necessitate changes in various items. It might be claimed that, with the hydraulic rotary, a lesser assortment of fishing tools was required, because of the smaller variety of tools or appliances used below the surface of the ground.

Whilst the rotary system was a satisfactory mechanical means of overcoming difficulties, it was not considered desirable to introduce this method for wild catting or pioneer work, or for geological investigations, but it should often form an auxiliary to percussion tools.

In view of the importance of the early indications of oil and gas, and the meagre geological information available, the driller should not be expected to assume the great responsibility of reporting or expressing an opinion which is frequently accepted. His decision might be misleading and cause heavy expenditure in unnecessary further drilling or abandonment of good producing areas. The duty of the driller was to make a satisfactory well in a reasonable and economical manner.

There was need for greater co-operation between the geologist (or consulting engineer) and the manufacturer with the field management. Manufacturers of machinery, tools, pipe and all supplies should be held responsible for the quality and construction of material furnished, but not for the manner in which it was used.

Finally, a typical specification of the essential material for a complete hydraulic rotary outfit to 3,000 ft. was given.

The daily output of the Alsatian potash mines is stated to be 4,000-5,000 tons, but owing to shortage of transport, daily deliveries do not exceed 2,000-3,000 tons.

Dyes for Pigment and Lake Colour

Mr. J. B. Shaw on Their Manufacture and Use

In a Paper before the Oil and Colour Chemists' Association, on Thursday, March 11, on "Various Points in the Manufacture and Use of Dyes for Pigment and Lake Colour," Mr. J. B. Shaw said that one good result of the war had been the formation of the Oil and Colour Chemists' Association, and the awakening of lake manufacturers to a full sense of their responsibilities. In pre-war days lake chemists in this country were more or less lacking in initiative and too much given to relying on German dye manufacturers for information regarding colours for lakes. A very large proportion of the trade was spoon-fed, and a good many firms dispensed with chemists altogether, and relied on such information as the Germans were only too willing to give to an intelligent foreman. The lake manufacturers were, perhaps, most behind in their methods, whilst the Germans gave every facility to consumers who wished to spend any time in their laboratories, and the textile, paper, leather and other industries very largely availed themselves of those facilities to their great advantage. He had known as many as six chemists from various firms abroad in the laboratory of one German firm of lake manufacturers exclusively engaged in the study of lake manufacture. The progress made since 1914, however, was a miracle, and what the British dye manufacturers had accomplished could have been accomplished by no other nation in the world.

Too Much Stress on German Work

He felt that the Papers read before the Association from time to time laid far too much stress on what the Germans had done in pre-war days, because a long experience as a user, and also as a representative of the trade had convinced him that the Germans had many failings, and, perhaps, most in regard to pigment dyes. This class of colour varied more than any other, and the German manufacturers had had constant claims made upon them in consequence.

With regard to the lake colours produced by the Germans for the printing ink trade, he had heard it stated that the German firms had access to colours which were not offered in this country, but that was not a fact, and it could easily have been proved by submitting any sample of lake to the German dye manufacturers who would have identified the colouring matter and given particulars for the production of the lake.

There were some difficulties of the lake chemists which, whilst not so much in evidence to-day as in previous days, nevertheless still existed. Some firms, when receiving a sample to be matched, obliterated all names, and sent it to the chemist under a number, without any details as to what the colour was to be. That was manifestly unfair, and he was pleased that the practice was not so prevalent to-day. The more details the chemist could have when given a sample to be matched, the more likely was the consumer to be satisfied.

Acid Colours

Dealing with matters relating to the actual production of lake colours, the Paper first referred to acid colours. The German pattern cards of lake gave a stereotyped formula, such as 10 parts of sulphate of alumina, 5 parts soda ash, 2 parts colour, and 12 parts barium chloride, and the results arrived at were generally satisfactory. At the same time, it did not follow that the best results were obtained. His contention was that no hard and fast rule could be laid down, and that every colour needed individual attention. He had seen colours which had been made up by three different processes. The first formula was 10 parts sulphate of alumina, 4 parts soda ash, 5 parts colour, and 13 parts barium chloride. The second formula split up the soda ash—viz., 10 parts sulphate of alumina, 1½ parts soda ash, 5 parts colour, 15 parts barium chloride, and 2½ parts soda ash. It was necessary in this case to see that effervescence had ceased after the addition of the first soda solution, and that the solution was perfectly clear before adding the colour solution. The third formula was one in which the alumina was split into two parts: 5 parts sulphate of alumina, 4 parts soda ash, 5 parts colour, 15 parts barium chloride, and 5 parts sulphate of alumina. In either case the yield of the colour was the same. With one exception, however, Nos. 2 and 3 were undoubtedly the best, and the shades varied in a remarkable degree. The exception was Orange II., which was not suited to the No. 2 process.

A great diversity of opinion existed as to the method of producing alizarine lakes, and as to whether the best results could be obtained by using an autoclave, steaming under pressure, or open boiling, was a matter of controversy, but he had seen the finest alizarine lakes produced by boiling in an open vat, and he had also been assured by a chemist from one of the best known German lake manufacturers that 15 per cent. of their alizarine or madder lakes for the printing ink trade were produced in open vats.

Attention was then drawn to three types of acid alizarine colours as being of great importance—viz., helio, fast blue, alizarine cyamine green and helio fast rubine. The first and second were, said the author, now made in this country under the names of alizarine delphinol or durasol acid blue, whilst the green had been given the same name. They were both exceedingly fast colours under any conditions, and would have a very extensive use when available in large quantities. The third, helio fast rubine, was one of the finest colours of this class, and before the war was very expensive, 6s. per lb. A feature of it was that the weaker the shade the greater the fastness to light.

Intermediates for Pigment Makers

With regard to pigment colours, Mr. Shaw did not think there was any immediate prospect of the necessary intermediates being available to enable pigment manufacturers to produce their own dyes, as suggested in a recent Paper by Mr. Allsebrook, as these intermediates were used in the production of several other colours, and British manufacturers had not enough for their own requirements. Plant for these intermediates was not built very quickly, and pigment manufacturers would have to exercise even greater patience than they had done in the past before their dream in this direction was realised. The manufacture of lithol red R, or monolite red R, as it was called by the British Dyestuffs Corporation, was the first achievement of British makers, who were to be congratulated on having produced a colour as good as that of the pre-war article. His experience was that equal parts of dry colouring matter and barium chloride or calcium chloride gave the best results. It was also very necessary that the colour should be actually boiled, although continued boiling was not beneficial. A peculiar feature of it was that when perfectly dry without having been made up on any base, it was very soluble in oil, but as soon as it took up the least moisture it became insoluble.

Fastness to Light

The Paper concluded with some reference to the question of fastness to light. It was not possible, Mr. Shaw said, to set up an all-round definition of fastness, as what would be regarded as fast in one industry might be looked upon as fugitive in another. Therefore, it was necessary that each trade should have its own standard, if such a standard could be set up. Some colours were faster on one base than on another. Malachite or brilliant green on a green earth on paper would last for weeks, but on a white earth they would fade almost entirely in a day. Samples of catalpo were shown ,but it was pointed out that, with the exception of methylene blue, they were all hopeless after three days' exposure in this country in March last year. On an alumina hydrate blanc fixi base with tannic acid, they were much faster, and some combinations of acid and basic colours, although extremely fugitive individually, became fairly fast. Helio fast rubine R. was the fastest colour he had come across of coal tar series. Alizarine lakes showed little change in the full strength in five weeks, and reductions, though certainly marked in fading, were quite good after the same period. Full strength shades of lithol red and anthol red faded considerably in one month, and reductions were entirely bleached in the same period. Helio fast red stood very well for one month, and a combination of this colour with helio fast rubine gave even better results. Lake red P. after 21 days gave infinitely better results than lithol red R.

The Chairman's Views

The Chairman (Mr. W. E. Palmer) asked whether there was any immediate hope of any decent acid green coming forward ? It was almost an unknown quantity on the market at the moment. Mr. Shaw had contrasted alizarine lakes made in the open vat with those made in the autoclave. Personally he had not come across any that were anything like so bright and brilliant as the best he had seen from the autoclave process, and he would be very much interested to see one. He was sure all present were sorry to hear that there was no good prospect of obtaining intermediates in the future. He had been much struck with what Mr. Shaw had said about the lake red P., which had been on the market some months ago; which was so brown and gave not really bright but bricky reds. The present day lake red P. was certainly much superior in that respect—very little inferior to the pre-war lake red P. as produced by German manufacturers—but it certainly was not of equal strength to the bricky red lake P. The helio yellow referred to was probably the same as he (the Chairman) had had experience of before the war. As a pigment yellow he thought it the purest yellow of greenish tone that he had ever seen.

General Discussion

Mr. E. Aston said with regard to the precipitation of dyestuffs—referring to the two soda processes and the two alum processes—he had found the lake precipitated in such a fine state of division that filtration was difficult. With regard to alizarine lakes and the question whether open boiling or autoclave was better, the autoclave yielded lakes which were very fine bright rich reds, and very soft in texture; but this was merely a question of the dry appearance, and the tint on reduction for printing ink purposes was not superior to that produced by ordinary open boiling. As to pigment colours, lake makers would do far better with the intermediates than with the pigment colours themselves. One reason was that the pigment colours varied. It was admittedly difficult to overcome variation. The reason was that in the precipitation of these pigment colours physical changes took place which it was very difficult to control on a large scale. It was not a question of strength of solutions or temperature, but some physical conditions which he could not quite understand. As to lithol red, the British dye manufacturers had made wonderful progress, there was not much fault to find with it as compared with pre-war makes.

Mr. Dyson said a sheet that had been passed round showed lithol red with a precipitation on catalpa and a precipitation on alumina. The catalpa lake was much dirtier than the alumina, and he had found that to be the case with catalpa all the way through. But very often they could reduce a lake that had already been made on alumina, or alumina blanc fixe, with catalpa with quite excellent results, and they could put quite a large percentage of catalpa in, provided they started with a good lake. On the other hand, he had had very interesting experiments with lakes on catalpa; he had never found the same brightness of colour when printed on paper and when there was time for the medium to amalgamate with the fibres of the paper. In all cases the catalpa lakes in the finish were dull, anything that was a bright tone colour lost its brightness, and when holding the print up to the light, there was always a certain sort of blackish overtone. He had found some pre-war lake red P. and some pre-war lithol, and had compared them with some recent English specimens made from German dye; the object of his experiment was to ascertain whether the present day dyes would stand anything like the amount of grinding that the old ones would. The dyes had been passed through mills identical in every way, the two mills running side by side. In eight times through the English-made colours had lost every fraction of their tone, whereas the pre-war colours were very slightly dirty without their real tone being altered appreciably. After going, he believed, eighteen times through they began to get very noticeably brown. He had been very much interested in Mr. Shaw's remarks with regard to alizarine madder, whether it should be made by the boiling process or by autoclave. One firm was now offering him alizarine madder that was absolutely identical with the best specimens that had ever been offered him before the war. The representative of this firm had assured him that they used British alizarine, and used British alizarine before the war.

Mr. Richards asked whether many difficulties were not due to the coupling of the colours? Many people drew attention to the physical state of the dye, but it was very largely chemical. It depended on the conditions of the intermediates before they were coupled together. As they were coupled the conditions of the solutions made a difference of fastness or lightness.

Mr. Shaw's Reply

Mr. Shaw, in replying to the discussion, said that with regard to Mr. Aston's question about the exposure of colour solid in methol spirit, it was a very strange thing, but the colour soluble in spirit was much faster than that in water. He could not give an explanation any more than he could say why malachite red was fast on green earth and not on white earth. With regard to the basic colours on catalpa, Mr. Aston had said he had not found these better than on white earth; that might be quite true, but white earth colours could not be put to the same use as catalpa colours. A white earth colour could not be polished, so it would be no use to a paper stainer as a polishing colour. No doubt where a colour was exposed in oil and afterwards varnished, it was far faster to light than if it had not been varnished. Where a colour was bleached through exposure to light, if you took off the top layer with your thumb nail you would often find the colour all right underneath where the light had not got at it; in some way the varnish prevented the light from affecting the colour. With regard to exposure under glass, some were made under glass and some exposed to atmospheric conditions. There was very little difference provided the rain was kept off the one that was exposed to the air. There was no prospect of Hansa green being on the market for some little time so far as he knew. Hansa yellow would be, and it was quite easy to make a good green using Hansa yellow.

As to Mr. Palmer's question in regard to acid green, the only acid green at present on the market was alizarine green; but very shortly Papal blue would be on the market; this would be a great help, for some very good greens could be got by combinations of yellow with Papal blue.

In regard to alizarine lakes and autoclaves, Mr. Palmer and Mr. Aston had practically confirmed his contention that you did not get the same strength from the autoclave process as from the other, and Mr. Aston had also said that the autoclaves were very much weaker as printing ink colours. That confirmed what he had been told in Germany and had seen demonstrated in London—that autoclave colours were not nearly so good. His informant in Germany had told him that 75 per cent. of their colours were made in the open vat—that was for printing inks. As to the development of lythol red R. with calcium lake, the calcium lakes were almost invariably weaker than the varium lakes.

With regard to the two soda processes and the two alum processes, Mr. Aston had mentioned his difficulties in filtration; they were due to the colours that were being used. Mr. Aston's failure to get good results from helio fast rubine were probably due to his method of precipitation. There were two methods—by one the precipitation was made at 80 deg., but so made the colour faded in a day; there must be boiling. It took an hour to get the last portion of soda in, and if it was not got in at the boil the colour was correspondingly more fugitive.

As to Mr. Dyson's question about sheet 12 lythol red, he agreed that catalpa and alumina could not be compared.

Wet and Dry Systems of Gas Cleaning

Paper by Mr. G. W. Hewson

At a general meeting of the Newcastle and District Section of the National Association of Industrial Chemists, on Saturday, March 6, Mr. G. W. Hewson read a Paper on "Gas Cleaning," dealing specifically with blast furnace waste gases.

Mr. Hewson remarked that hitherto the blast furnace had been primarily considered as a pig-iron producer, all other products being considered in the light of the assistance they gave to the main product. He referred to the use which had been made of slag, &c., but within the past few years a good deal of attention had been given to the recovery of potash contained in the dust, even to the extent of making it the main product and iron the by-product. The value and importance of that by-product, however, only became commercially successful as a result of what was formerly waste gas becoming more efficiently utilised. The burden of such a name as "waste" gas had, he believed, been the reason for the slow development of the use of blast furnace gas. It had been either not used or used wastefully, owing to a large extent to the isolation of the engineer and chemist in works practice. He dwelt at length on the importance of the engineer and chemist working hand in hand in research and other work. For many years the only feasible method put forward for cleaning the gas was by "wet" cleaning, such gas being generally used for gas engines. It became more and more evident that for power purposes freedom from dust was important. He described the more familiar methods of wet cleaning and considered there were many disadvantages, including the difficulty of dealing with the mud, re-cleaning the water, the expense of keeping the plant clean and in order, the large consumption of water and of power.

The Halberg-Beth Dry System

The first dry system to meet with any degree of success in blast furnace practice was the Halberg-Beth system erected in 1910. The experience gained with the first plant was followed by two new erections in 1911, and by 1914 50 plants of large capacity were in course of construction. The gases given off by the furnaces were collected and conveyed by large mains to coolers. There the temperature of the gas was reduced to 80° or 90°C. To avoid the risk of moisture being deposited in the filter chamber, the gas was superheated about 10°C. and passed through filter bags into a common clean gas main. The bottoms of the bags where the gas entered were open-ended, the lower ends being attached to a ring or neck, which was rigidly held in a plate just above the dust-collecting chamber. The tops of the bags were closed by steel caps, suitably suspended from the shaking frame. The gas passing from the inside to the outside of the bags was drawn through the plant by fans which delivered the clean gas to the distributing mains for consumption in boilers, stoves or engines. At intervals of from 10 to 15 minutes the bags in each compartment were shaken to remove dust adhering to the inside of the filtering medium. Starting with gas containing six grammes of dust per cubic metre the system could clean it to 0·001 grammes per cubic metre. The gas, after leaving the fans, if to be used for engines, was passed through a cooling tower to lower the temperature to 30°C.

Electrical Precipitation

Mr. Hewson then dealt at some length with electrical precipitation. One of the strongest arguments put forward in favour of electrical precipitation of the dust was the fact that it did not necessitate cooling the gas as in the other methods. In the wet and Halberg-Beth processes the value of the sensible heat of the gas was lost. In an electrical cleaner the gas was conducted through a vertical pipe, entering from the bottom. An electrode chain of wire was suspended vertically in the exact centre of the pipe and held taut by a weight. The electrode was charged with high-tension unidirectional current and therefore should be suspended on insulators capable of withstanding the potential under which they were impressed. The pipe was earthed and when the dirty gas passed through the pipe and came in contact with the charged electrode it became ionised. As the electrode was negatively charged and had a corona discharge due to the high potential impressed upon it, the ionisation of the gas was rapid and thorough. Immediately on being charged, the dust and fume particles were repelled by the electrode and deposited on the side of the pipe which interrupted their flight from the chain. The dust particle adhered to the side of the pipe as it was held fast by the resultant electrostatic force acting upon it during the operation. After several hours' operation the electrical action became erratic and the pipes were rapped. That method cleaned gas very well for stoves and boilers, but it did not clean it sufficiently for gas engines. If the gas were intended for gas engines a further cleaning plant was necessary. In conclusion, Mr. Hewson said that though much had been written regarding the erection of super-power stations and the harnessing of power from waste material at the collieries, he thought there was an equally large field for the economic use of the gases leaving the 300 blast furnaces in operation in Great Britain. At a very modest estimate, from 100 to 200 million cubic feet of gas per hour at 100 B.T.U.'s per cubic foot should be available for conversion into electrical energy.

Filtration and Softening of Water

Third Lecture by Dr. G. Grant Hepburn

THE last of the series of lectures on "Water Supplies: Their Filtration and Softening," by Dr. G. Grant Hepburn (Consultant in Water Purification), was delivered at the Manchester College of Technology, there being, as formerly, a very large attendance.

Water Softening

Dr. Hepburn stated that in the great majority of cases the hardness of a water was conditioned by salts of calcium and magnesium, but cases occurred in which it was due largely to salts of other metals, chiefly iron and aluminium. The objection to the presence of salts of lime and magnesia in water was well known. For instance, soap would not lather, and for textile purposes, independent of the soap destroying power of the water, it was often unsuitable, while boilers were liable to scale formation which interfered with the transmission of heat and resulted in a waste of coal, the corrosion of the boiler plates, thus possibly leading to explosion, and to an unequal straining of the boiler plates themselves. The cost of chipping off the scale from a boiler was considerable, and might be as much as £1 a week. In the case of a boiler plate with no scale its temperature might be 350°F., with the flue gases at 900 to 1,400, the water 340°F., the pressure being equal to 100 lb. In the case of a scale formation ½ in. thick, the flue gases and boiler pressure being the same as before, the metal plate doubled its temperature and became dull red through its inability to pass the heat quickly enough to the water.

In order to eliminate the deleterious effects of hardness, the water had to be softened—the lime and magnesia salts must be removed. Until 1906 the only method of doing this was by the use of soda ash and lime. Then Professor Gans brought forward the Permutit method. The plants operating by the use of soda ash and lime fell naturally into two divisions—*i.e.*, the intermittent Archbut-Deeley type and the continuous type—both of which were explained in detail by the lecturer.

The Archbut-Deeley Type

A cross-section of the Archbut-Deeley type of Mather & Platt showed a large tank built up in standard plates. There was also a tank for mixing the chemicals, and a definite quantity of lime or soda ash was weighed out for every tankful of water according to requirements. Having been slaked, mixed up and divided into a liquor which would flow, it was sucked and injected through an upper row of perforated pipes by a steam injector. Water was next injected through these pipes to rid them of the lime and ash they contained; finally, air was blown through for about a minute. The steam injector was then turned on to a bottom row of perforated pipes, air being sucked in by a valve, and by a system of agitation the whole of the 6 in. to 12 in. of mud in the bottom of the tank was stirred up. A great weight of mud from previous softenings was thus thoroughly mixed with the water, and by friction of the mud with the water the latter softened quickly. No matter how bad the water might be, and no matter how much magnesia it contained, water in the period of one hour could be softened down to between 4 and 5 deg. of hardness.

An elevation of the Archbut-Deeley plant was also shown, and, in continuing his explanation, Dr. Hepburn referred to the device of floats for supporting a copper or zinc discharge pipe. By means of these floats the draw-off end of this pipe was always kept just below the surface of the water, and it was always drawing the water from its highest level—*i.e.*, the water which had had the longest period of settlement. To refill the tank the float was pulled up by a windlass. Formerly the water was carbonated (that is to say, any free lime the softened water might contain was turned into calcium carbonate by gases from a coke stove) in this floating arm discharge pipe. This stove was worked by a steam injector which delivered the gases into a pipe entering at the bottom of the floating arm discharge. The water came in over baffle plates, and was thoroughly mixed with the gas. He had, however, had this altered on account of the choking action of the coke stove gases, with consequent inability to carbonate efficiently, and at the same time empty a tank quickly. In recent years the carbonating was done in a small sump. A very important point in regard to softening was never to let the water get away with a content of free lime, one reason being that such a water, even though it was softened down to 4 or 5 deg. would very readily deposit carbonate of lime on the sides of a pipe on account of the friction of the water as it passed along it. This very important drawback was removed by carbonating. Another point was that a hot water heater was certain, sooner or later, to become made up unless the water was carbonated. This matter had also an important bearing in the textile industries. For example, in bleaching if in drying up white cotton piece goods the last wash were given with water containing from ¼ lb. to ½ lb. of free lime per 1,000 gallons, it would be found that on leaving the drums the pieces would have a yellowish cast. It was essential in such a case to neutralise the calcium hydrate in the water and turn it into carbonate of lime.

The Continuous Type

Dr. Hepburn next explained the construction and method of operation of the Reisert continuous type of water softener of Messrs. Royles, Ltd. The hard water entered a middle box and attained a definite depth over three pipe outlets which was regulated by a ball. Two of the pipes were provided with micrometer screws, so that the flow through each of them could be adjusted accurately. A third pipe delivered the water to the bottom of a lime saturating cone which received its supply of slaked quicklime from a tank. A tank was provided for dissolving the carbonate of soda, which was let down into the sodium carbonate delivery tank. The water was saturated with lime as it rose through the saturator, and, in a saturator properly dimensioned for its duty, a clear solution of calcium hydrate was delivered from it, containing no suspended matter. The saturate solution of quicklime contained only 1·25 to 1·3 grammes of quicklime (CaO) to the litre, so that if the flow were constant it could be ascertained exactly how much lime water or lime was being delivered per hour. Soda ash solution was delivered from a cylindrical tank by a pipe rising from near its bottom, and the supply was regulated by allowing water from the hard water tank to pass through a micrometer valve and leading it on to the surface of the soda ash solution. The soda ash solution was of a higher specific gravity than water, and therefore if the water was carefully flowed on to the solution no mixing would occur. A disc was provided in order to obviate any mixing through the momentum of the falling water. More water had to be added than carbonate of soda being delivered, on account of the difference in specific gravity. The water, having received its addition of lime or soda ash, passed downwards through the inlet pipe into the settling tank, where it gradually rose, shedding as it did so most of the precipitate formed in the softening process. It then poured over a downward central pipe into the filtration chamber. The settling tank was fitted with a conical bottom to collect the sludge to a central outlet sludge pipe through which it was periodically let off to drain. The settled water had the last of its suspended matter removed from it by downward filtration through a sand or quartz filter from whence it rose into a tank. There was an automatic flushing arrangement for washing the filter bed which was very ingenious. As the bed became foul the loss of head increased, so that the water rose in the overflow pipe feeding the filter from the settling chamber. This overflow pipe was in hydraulic connection with a second, capable of starting syphonic action which flushed out the filter bed, the water for the flush being contained in a small tank at the side of the softener. The flushing being completed the syphon action was broken, and filtration started again. The whole was automatic. Siphon action was very useful in hydraulic engineering, because it brought about an automatic, periodic action, and it was possible to have multiple automatic simultaneous action from it.

The weak point of the lime saturating cone was that when the lime was slaked all sizes of small particles were obtained, there thus being varying rates of fall through the water. Therefore, if clear lime water was to be delivered by the cone the upward velocity of the water in its top part as it came to the point of being drawn off must be lower than the downward rate of fall in water of the smallest lime particle. It was only when that condition was fulfilled that a lime water could be obtained which was of constant lime strength.

The Kennicott Water Softener

The first plant described by Dr. Hepburn as using milk of lime was the Kennicott water softener. The water was delivered by a pipe into a hard water tank about 18 in. deep, below which was a water wheel. The tank was divided into two compartments by a metal plate, which was perforated with small holes, and faced with fine mesh wire gauze to prevent the passage of suspended matter into a small compartment shown in the illustration. From this small compartment a pipe was led to a dividing box. In the bottom of the other compartment was a slot covered by a shutter. The slot was graduated to indicate the quantity of water passing through it, the level in the tank being kept constant by a ball valve. The water passing through the slot drove a water wheel which sent out a shaft which worked an agitator in the chemical tank, and also an agitator in the down take pipe of the settling tank. In the dividing box, which was 10 in. in diameter, a cylinder divided by a small cross-partition into two halves was cast. The water coming through a ¾ in. pipe from the hard water tank rose in the dividing box and overflowed the two segments of the cylinder shown. On the top of the cylinder there was a disc with a sector cut into it. By bringing more or less of this sector over one or other of the two portions of the partitioned cylinder the quantity of water going down either part of it could be regulated. The water going down one section ran back into the softener, while that going down the other fell into "the regulating tank," and in proportion as water fell in a float, connected, by wire with a floating arm discharge pipe in the neighbouring chemical tank, rose. The discharge pipe in the chemical tank had a horizontal cylindrical cross-piece, closed at both ends, but slotted along its upper surface. As the float rose in the "regulating tank" the discharge pipe fell in the chemical tank and a proportionate quantity of chemicals (lime and ash) was delivered to the hard water going into the settling tank. The upper part of the settling tank contained a wood-wool filter. In the clear space over the filter there was a device for making the plant work always at its full capacity—*i.e.*, there was a small pot of 18 in. diameter, worked by a float valve with a ¾ in. opening. A valve in the small pot controlled the inlet to the softener. The action of the ball valve controlling the inlet and outlet to the small pot was almost instantaneous. It was not

necessary to wait for a drop of an inch or two before the inflowing water was shut off. The plant always worked at its full capacity, and there was no question of the agitators delaying their action after the softener had been started up. In the bottom of the softener there was no cone to bring the sludge together, but there was an ingenious device of sludge pipes. There were two pipe arms which could be made to revolve round the exit pipe, by means of a worm and bevel gear. These pipes were closed at the ends, but on their under faces they had a slot. By turning a hand wheel they were made to revolve round the whole area of the bottom of the tank, and throughout the whole mass of sludge, and by opening a valve the sludge was pressed by the weight of water above it out of the softener.

Dr. Hepburn then described the method adopted for adding the chemicals in the case of the Paterson water softener and a device adopted by the United Softeners, Ltd. (Lassens & Hjort). The principle of the Osilameter was upon similar lines to that used by the Paterson Engineering Co.

The Permutit Method

The method of water softening adopted by Professor Gans was that of filtering water through artificial zeolites. He found, in 1906, that artificial zeolites formed by fusing together aluminium silicate, soda ash and silica had the same property as the natural ones of exchanging sodium for certain metals, more especially lime and magnesia; and that on treating the lime and magnesium zeolites thus formed with common salt solution the original sodium zeolite was formed. This made these bodies applicable for water softening, and the discovery was soon applied to that purpose. The substance that Gans recommended for water softening had the formula—

$$2\ SiO_2 + Al_2O_3 + Na_2O + 6H_2O,$$

i.e., there was a small quantity of sodium for a high molecular weight—392.

The method of application was simply to filter the water through a bed of zeolites. By doing so water of zero degree of hardness was obtained; but the filtrate had the objectionable feature that its alkalinity was high, it being in the form of sodium carbonate. This fact retarded the use of the process for a considerable time, but the difficulty had now been surmounted by softening the water with lime and soda ash previous to its going on to the permutit filter bed, thus obtaining a water of zero degree of hardness and low alkalinity. In filtering water through Permutit beds for zero hardness the rates were: For hard water of 5 deg. of hardness and 39 in. depth of bed, about 250 gallons per hour to the square foot. This was much the same result as was obtained by rapid filtration plants with quartz filters. If the raw water hardness were 10, then, through a depth of 39 in., the rate fell to 150 gallons per square foot and hour; and 20 deg. of hardness became 80 gallons to the square foot and hour. If magnesia were present the interchange was slower than in the case of lime, and any hardness due to magnesia must be doubled. The permutit, after working for some time, became exhausted, and had to be regenerated. This regeneration was effected by using a solution of common salt. Theoretically two molecules of common salt corresponded to one molecule of lime—*i.e.*, 117 parts of common salt were equivalent to 56 parts of lime, and 117 parts of salt were equivalent chemically to 40 parts of magnesia. But being a reverse action an excess of salt had to be used. For every 56 lb. that the permutit took up there was not used 117 parts of salt, but five times that quantity, while for every 40 lb. of magnesia that the permutit bed absorbed 10 times 117 lb. of salt must be used. This led to higher costs of working than for the soda ash and lime process. In waters where a low degree of hardness was not required, three or four being sufficient, and where there was high alkalinity due to the presence of carbonates of lime and magnesia, it was much cheaper to use the lime and soda ash process than that of permutit. The limitations of permutit were that in many cases it could not be used directly to soften the water on account of the high alkalinity of the filtrate. Again, a water fed to a permutit bed might not contain more than two parts of free carbonic acid per 100,000, otherwise the permutit disintegrated. A water containing more than 0·1 part of oxide of iron per 100,000 might not be fed to permutit, because it formed an iron permutit which could not be regenerated by salt, and the whole bed would in time be spoilt and rendered worthless. Two years ago permutit cost about £175 a ton. Water at a temperature above 37 or 38 deg. could not be softened with it, because the carbonate of lime in the water would separate out in the pores of the permutit, blocking them, and rendering the permutit worthless. Another point was that for regeneration a very considerable time was required—viz., 10 to 12 hours. That is to say, if the installation was going day and night it would be necessary to double the number of filters, and work one battery during the day, while through the night the other was being regenerated. Where a works did not work night and day the regeneration could take place at night. The removal of iron by permutit was effected in the followin way: If the sodium permutit be treated with manganous chloride solution a manganese permutit was the result, and if that be treated with permanganate of potash a high oxide of manganese (Mn_2O_7) was developed in the bed, and on passing water containing ferrous iron through it it was oxidised and precipitated as hydrate of iron.

Moisture in Washed Coal

A GENERAL meeting of the Northern Section of the Coke Oven Managers' Association was held at Darlington, on Saturday week, when Mr. J. W. Porteous presided. Two Papers were read by Mr. A. T. Thwaite, of Bowden Close, Durham.

In the first, on "Excessive Moisture in Washed Coal and its Effects on Bye-product Coke Ovens," Mr. Thwaite said that owners and coke oven construction companies had not yet been convinced of the need for providing not only good washing plants, but also an efficient system of extracting the surplus water from the freshly washed coal. The amount of moisture to give the best result on a plant was between 8 per cent. and 10 per cent., and he believed there were few plants maintaining that figure. To his knowledge there were only two systems for draining coal: First, ample bunker storage, which should have a capacity to allow washed coal at least 48 hours draining before charging, and, secondly, slow travelling draining conveyers and belts. An important point was the size after washing. He had been amazed to see at some plants large lumps of good coal mixed with inferior coal, all of which passed through a crusher, which ground it almost to powder. Had the large pieces of coal been separated and passed through a separate crusher to bring it to, say, from 2 in. cube downwards, coal of that size would materially assist the smaller sizes of coal to drain rapidly on the belts or in the bunkers. In designing a plant for preparing coal, due regard should be paid to the crushing plant in order to avoid unnecessary crushing.

In the course of the discussion, Dr. G. P. Lishman said that he had not yet heard of a really satisfactory way of getting rid of moisture in washed coals. At the plant with which he was connected they had tried drying machinery by which the coal was driven through a space by a ram and it took a certain amount of moisture away. It had to be abandoned, however, because of the drive it required. Later they tried a perforated plate under the bottom of the conveyer, and air was drawn through the plate. Possibly the coal was not on the plate long enough. The same machine had been used elsewhere for many years. Another alternative was the Ruggles coal dryer, which required that the coal should be heated. The coal tended to carbonise unless the process was very carefully regulated. There was a lot of water in the coal which he was using which had not been got rid of.

Mr. E. A. F. Knott said that he thought the centrifugal principle for drying would ultimately prove the best.

Mr. Thwaite said he did not think any method which involved heating would be practical on a large scale.

Mr. Mole said that a lot depended on the sort of coal used. If very small and "duffy" the drying was not efficient.

The Chairman said that Mr. Mole had touched the main point. He did not think they would ever get efficient drying even with big storage bunkers unless they extracted all coal below 1 mill. Once they got that out the remainder could be effectively drained in ordinary hoppers.

After the discussion on the first Paper, Mr. Thwaite gave some details of the Bowden Close benzol plant.

"Electrolytic Alkali and Chlorine Industry"

A LECTURE under the above title was delivered by Mr. John B. C. Kershaw, F.I.C., at the Manchester College of Technology on Tuesday, March 5.

Mr. Kershaw, in a short history of the subject, mentioned the research work of Davy, Faraday and Watt. Had Watt been able to generate larger currents of electricity for his experimental work, the lecturer said, he would have found that the production of alkali and chlorine in an electrolytic cell upon an industrial scale was not such a simple process as he had imagined, and that the choice of materials for, and construction of, durable anodes and diaphragms offered problems of considerable difficulty. The secondary reactions which occurred in the cell, between the chlorine ions liberated at the anode, and the sodium or potassium hydrate produced at the cathode also added considerably to the difficulties of manufacturing caustic alkali by this method. In addition to the difficulties resulting from the destructive action of the free chlorine and its oxygen compounds upon the anodes and diaphragm material, there was a loss due to the fact that a solution of sodium hydrate was a better conductor of electricity than one of sodium chloride, and that as the solution of sodium hydrate formed at the cathode increased in strength it shared more and more in the transfer of the electric current and this led to waste of electric energy and to a lowered efficiency of the cell. The remainder of the lecture dealt with the developments of electrolytic processes in the cells and power plants of various installations.

Books Received

INDUSTRIAL ORGANIC ANALYSIS. By Paul S. Arup, B.Sc., F.I.C. J. & A. Churchill, London. Pp. 471. 12s. 6d. net.

QUANTITATIVE ANALYSIS BY ELECTROLYSIS. By Alex. Classen. Revised by William T. Hall. Chapman & Hall, London. Pp. 346. 17s. 6d. net.

INDUSTRIAL ORGANIC ANALYSIS. By Paul S. Arup, B.Sc., F.I.C. Second Edition. J. & A. Churchill, London. Pp. 471. 12s. 6d. net.

Notes on French Chemical Industry

THE scarcity of chemicals is growing daily more serious, and its effects are becoming widespread. Thus the short supply of sulphuric acid, due to transport difficulties, is responsible for lack of superphosphates which are much needed by farmers. Trade with Germany offers no practical solution, because that country is unable to supply many of the products wanted, and it is also adopting obstructive tactics by exacting payment in dollars, pounds or Swiss francs. Many sodium and potassium salts are unobtainable ; in particular, there is a great shortage of sodium sulphide, which is much used in France, and the price of which has risen phenomenally.

In view of the diminished importation of chemicals, following the unfavourable rate of exchange, increased attention is being given to promote and control home production and distribution. With these ends in view, an association of producers, called L'Union des Fabricants de Produits chimiques, is in course of formation. Interest is also being aroused in the production of synthetic nitrogenous products. The new processes of M. G. Claude are being tested with great success at some experimental works near Montereau, and patent rights for the Haber process have been acquired by the firm Kulhmann, in conjunction with the colliery companies at Lens and the Banque de Paris. The construction of large factories for the production of synthetic ammonia, nitric acid, &c., is about to be taken in hand, and the capital to be invested in these undertakings will amount to 50 million francs.

Attention must also be drawn to the formation of the Société l'Hydroxyl, at Asnieres (225, Quai Aulaguier), with a capital of 8 million francs, to engage in the hardening of oils by hydrogenation. It is an offshoot of La Société l'Oxylithe, and Lever Brothers, Ltd., has an interest in it. In the dye industry the chief event to be noted is the amalgamation of La Société nationale des Matieres Colorantes with La Société des Colorantes français. The programme of the combine includes the erection of a new factory to produce aniline, and another to manufacture liquid chlorine, caustic soda, calcium chloride, &c., by electrolysis. Another new promotion is La Société Générale pour la fabrication des coleurs et produits chimiques, with a capital of 4,200,000 francs.

The daily output of the new petroleum well at Pechelbronn has risen from 30 to 60 tons, thus bringing the total daily production in Alsace to 200 tons. Madagascar is also mentioned as a great potential source of petroleum, and the creation of a British company, the Majunga Oilfields of Madagascar, Ltd., with a capital of £200,000, is announced.—*Jour. Soc. Chem. Ind.*

Chemical Trade Inquiries

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Canada (Montreal)	Leather of all kinds and hides. Replies to the Office of the High Commissioner for Canada, 19, Victoria Street, S.W. 1.	322
Canada	Optical Glass. Replies to the Office of the High Commissioner for Canada, 19, Victoria Street, S.W. 1.	...
British West Indies (Barbados).	Glassware	328
Belgium (Antwerp)	Edible Oils	334
Roumania ...	Leather ; hid s and skins	339
Spain (Canary Islands)	Oils	340
Morocco (Casa Blanco)	Cement	346
Syria (Damascus)	Dyes	349
France (Paris) ...	Linseed Oil, Waxes, Chemicals ...	363
(Lyons)	Chemical and Pharmaceutical Products.	365
Italy (Palermo) ...	Drugs.	370
Persia (Hamadan)	Drugs and Chemists' Sundries ...	...
Argentine-Uruguay Paraguay	Chemicals	381A
Peru, Ecuador, Bolivia	Chemicals	...
South Africa ...	Drugs. Tenders to the Chairman, Provincial Hospitals, Transvaal Provincial Tender Board, P.O. Box 1040, Pretoria.	

THE BRITISH CHEMICAL TRADE ASSOCIATION—The Association has been advised by the Department of Overseas Trade of an inquiry for a weekly supply of 10 cwt. of acetaldehyde. Members interested may obtain the name and address of the firm on application to this Association.

Society of Chemical Industry

Annual Meeting of Edinburgh Section

THE annual meeting of the Edinburgh and East of Scotland Section of the Society of Chemical Industry was held in the Edinburgh and East of Scotland Agricultural College, on Tuesday, March 9, Dr. D. S. Jerdan, president, in the chair.

New Officers

Dr. Jerdan was re-elected president, Dr. H. E. Wall vice-president, and Dr. Lauder hon. secretary and treasurer. Four vacancies on the committee were filled by the election of Major Robert Bruce, Mr. W. T. H. Williamson, Mr. Adam Tait and Dr. J. L. Locker, and a vote of thanks passed to the four retiring members.

The Work of the Year

Dr. Lauder, hon. secretary, in his report on the work of the past session, said that the attendance and interest had been well maintained. At the end of the previous year they had 136, 2 new members had been admitted, 35 had been transferred from other sections, and the present membership was 159. The committee's meeting with Sir John Gray, the President, and Dr. Longstaff, the general secretary, from headquarters was greatly appreciated. To fill the place of Mr. Middlemass, who had been a member of the committee for the last two years, and had obtained promotion to a post near London, the committee had elected Mr. C. Norman Kemp for the remainder of the period.

Production and Uses of X-Rays

At the ordinary meeting which was held subsequently, Mr. C. Norman Kemp, B.Sc., A.I.C., submitted a Paper on "The Production and Uses of X-rays, and Some Account of their Recent Applications to the Examination of Materials." He surveyed the discovery of X-rays and the early apparatus used for producing them, described the modern apparatus ordinarily used, and gave some details of the recent improvements in methods and technique. Faults, he pointed out, could readily be detected in glass, in addition to metals, and the discovery had proved very useful in the manufacture of the highest kinds of optical glass in preventing the use of glasses in which air blows had been included. Reinforced concrete could be equally well examined by X-rays without breaking up the concrete.

The same remark applied to the manufacture of gunmetal. A great many interesting problems arose in connection with magnetic alloys, and in the casting of bronze, aluminium, iron and other materials that were machined in forging and welding.

The lecturer specially emphasised the fact that all materials according to their density were more or less transparent, illustrating this by X-ray photograph of an oil painting, which showed the main outlines of the subject as revealed by the varying densities of the pigments employed. One method particularly appealed to the chemist in relation to the determination of viscosity, and it was likely to become extremely useful to dentists.

Mrs. C. Norman Kemp, M.A., D.Sc., also read a short Paper on some points of chemical interest in connection with the application of X-rays to medicine and surgery.

A discussion followed, to which Dr. Lauder, Mr. J. R. Hill, Mr. G. F. Merson, Mr. Cameron, Mr. Williamson, Mr. Porritt, Mr. Romanes, Mr. Anderson and the President contributed.

Professor Kipping on Silicon Compounds

AT a meeting of the Nottingham Section of the Society of Chemical Industry, held on Friday, March 12, Professor F. S. Kipping, Ph.D., D.Sc., F.I.C., F.R.S., gave a most interesting outline of his researches, which were primarily directed towards the preparation of an optically active compound containing an asymmetric silicon atom and its resolution into the two stereoisomeric forms. In these researches, which were begun more than twenty years ago, the lecturer succeeded early in preparing condensation products of $SiCl_4$ with alcohols and phenols which contained the asymmetric silicon atom, but were too unstable for the purpose in hand. His discovery in 1903 that the Grignard reaction could be used in the case of $SiCl_4$ resulted in the preparation of compounds $R_1R_2R_3SiCl$. Although these compounds contained asymmetrically linked silicon they were not themselves suitable for resolution, but a sulphonated di-silicon oxide from

$$\begin{matrix} CH_3 \\ C_3H_7 \end{matrix}>Si<\begin{matrix} CH_2C_6H_5 \\ OH \end{matrix}$$

(itself prepared by a remarkable reaction) was resolved by means of its d. methyl hydrindonium salt into enantio-morphs with a definite, though low, specific rotation. Later, the sulphonic acid—

$$\begin{matrix} C_2H_5 \\ C_3H_7 \end{matrix}>Si<\begin{matrix} CH_2C_6H_4SO_3H \\ CH_2C_6H_5 \end{matrix}$$

was isolated from a mixture, and was successfully resolved by means of its brucine salt.

The lecturer described many interesting differences between silicon and carbon compounds, and made some important observations on the structures of the open and closed chain phenylated silicic acids.

Chemical Matters in Parliament

British Cellulose Co.

Mr. Remer asked the Chancellor of the Exchequer (House of Commons, March 11) the date or dates when the £1,450,000 was advanced to the British Cellulose Co., and the amount advanced on each date?

Mr. Hope: The dates of payment are as follows: August 24, 1917, £25,000; September 4, 1917, £75,000; September 28, 1917, £100,000; June 27, 1918, £235,000; July 6, 1918, £50,000; July 28, £200,000; August 17, 1918, £100,000; September 6, 1918, £50,000; September 19, 1918, £50,000; September 27, 1918, £100,000; October 4, 1918, £50,000; October 12, 1918, £3,000; October 16, 1918, £50,000; October 25, 1918, £6,000; November 20, 1918, £6,000; November 20, 1918, £15,000; November 25, 1918, £22,000; November 29, 1918, £10,000; February 6, 1919, £303,000; £1,450,000. These were in respect of charges necessarily incurred earlier than the dates shown. They were made under the terms of agreements which were consolidated into one agreement dated June 27, 1918.

Mr. Kiley asked the Parliamentary Secretary to the Ministry of Munitions (House of Commons, March 11) whether he was aware that the prospectus published in the newspaper press offering £2,800,000 cumulative participating preference shares in the British Cellulose & Chemical Manufacturing (Parent) Co., Ltd., to the public failed to make essential disclosures required of a published prospectus by Section 81 of the Companies (Consolidation) Act of 1908; that the prospectus in particular failed to state the number and amount of shares issued as fully or partly paid up otherwise than in cash, and the consideration for which those shares had been issued, and also failed to give the dates of and parties to every material contract and full particulars of the nature and extent of the interest in the promotion of the company of every director so interested; was he informed about the particulars thus withheld from the public; and, if so, would he inform the House of these particulars?

Mr. Hope: The responsibility for the advertisement of the issue rests not with the Government, but with the issuing house. I am, not, however, aware of any omission on their part of any particulars required by law to be given, and I am advised that the advertisement was not a "prospectus" within the meaning of Section 81 of the Companies (Consolidation) Act, 1908.

Dr. Macnamara, in reply to Mr. Remer (House of Commons, March 11), stated: I am advised that Dr. Camille Dreyfus is of Swiss nationality and Switzerland is his country of origin. Both of his parents were of French nationality. He has not been naturalised in Great Britain or in any other country.

Mr. Holmes asked the Parliamentary Secretary to the Ministry of Munitions (House of Commons, March 15) who were the parties for whom the Ministry held, as trustee, securities in the form of debentures or otherwise to the amount of £700,000 charged upon the assets and uncalled capital of the British Cellulose Manufacturing Co., Ltd.; and for what securities in the new British Cellulose & Chemical Manufacturing (Parent) Co., Ltd., were these debentures or other forms of charge to be exchanged?

Mr. Hope: The Ministry holds these £700,000 debentures in trust for the company's bankers and the Chilworth Gunpowder Co., Ltd. I understand that these £700,000 debentures will be paid off in cash out of the proceeds of the recent issue of shares.

Mr. Chamberlain, in reply to questions by Mr. Holmes (House of Commons, March 16), stated that the new essential industry which would have been liquidated if the Government had not agreed to take shares in this company was the manufacture of cellulose acetate for which the company was formed during the war, and for which its works would be available to the Government in case of future necessity. He had no knowledge of the extent, if any, to which articles to be made by the company during peace were now being made by other companies. The agreement with the company provided that the consent of the Minister of Munitions must be obtained before debentures could be issued. He was not prepared to undertake that Parliament should be consulted before any such consent was given. The total of the debentures and the other charges on the company held by Government Departments and private individuals on January last was £2,270,000. Of this amount the Ministry of Munitions held £1,450,000 on their own behalf, £500,000 as trustee for the London, County, Westminster & Parr's Bank, and £200,000 as trustee for the Chilworth Gunpowder Co. The remaining £120,000 were held by private persons, a list of whose names and holdings appeared in Appendix A of the report of Lord Sumner's Committee. He did not know whether there had been any variation in this list since the date of that Report. He was satisfied that it would not be in the interests of the Government or the taxpayer to force the company into liquidation, and that the public interests were best protected by the arrangements now made.

Mr. Remer asked the Chancellor of the Exchequer (House of Commons, March 17) whether he was aware that the maximum output of artificial silk by the British Cellulose Co. in any one week was 1¼ lb. of very poor quality; and whether in view of the highly speculative nature of this business, it would be desirable to sell these shares on the market at a substantial loss and thus obviate the possibility of the Treasury making a total loss.

Mr. Hope: The answer to both parts of the question is in the negative.

Manufacture of Cellulose Acetate

For a detailed statement of the offers of manufacture of cellulose acetate received by the Government during the war, Mr. Hope referred Mr. Holmes to the Fifth Report of the Select Committee on National Expenditure and to the Report of the British Cellulose Inquiry Committee (House of Commons, March 15).

Anglo-Persian Oil Co.

Viscount Curzon asked the Prime Minister (House of Commons, March 11) whether his attention had been drawn to the statement of the chairman of the Anglo-Persian Oil Co. to the effect that the contract under which his company undertook to supply the Shell Trading Co. with the whole of its output would expire in 1922, unless the Government should think fit in the meantime to interfere and declare that it was one in restraint of trade; and, in view of this statement and the effect of the enhanced price of petrol on trade and the cost of living, he would consider the advisability of interfering with this contract and secure the retail in this country of the whole of the output of this company free from the control of any oil trust and at the lowest possible figure?

Sir H. Greenwood: I understand that this contract has now been in force for over seven years, and was arranged at a time when the Anglo-Persian Oil Co. had no other means of disposing of its production. I do not consider that his Majesty's Government can now intervene in the manner suggested.

Royal Dutch Shell Petroleum Group

Mr. Higham asked the President of the Board of Trade (House of Commons, March 10) whether he had considered the offer made to him by the Royal Dutch Shell Petroleum group to place themselves unreservedly at the disposal of the Government and any other European Government for consultation as to the petrol position; and whether he intended to take advantage of this offer through the organisation of the League of Nations or otherwise?

Mr. Bridgeman: The offer of the Shell group will be borne in mind in considering the problem.

Importation of Foreign Gas Mantles

Lieut.-Colonel Sir J. Griffiths asked the President of the Board of Trade (House of Commons, March 15) for information in connection with the incandescent mantle industry; the unfettered importation of German and other foreign gas mantles into this country, and the relation of such importation to existing manufacturers in this country?

Mr. Bridgeman: The importation of incandescent gas mantles was prohibited, except under licence, until the date of the judgment of Mr. Justice Sankey in the case of the Attorney-General *v.* Brown. Since the suspension of the prohibition, the total value of the imports of gas mantles to the end of February was approximately £26,000, of which about £5,000 represented the value of goods consigned directly from Germany. Inasmuch as the value of the exports of gas mantles from Germany to this country in 1913 was approximately £250,000, it is evident that the competition from German sources with United Kingdom manufacturers is not at present serious.

Government Loan to Sugar Beet Growers' Society

Sir A. Griffith-Boscawen, in reply to Major Barnes (House of Commons, March 15) said that the loan from the Development Fund to British Sugar Beet Growers' Society is £130,125, and is secured on the Society's estate at Kelham by a mortgage at 5 per cent. interest. The amount of the loan now stands at £82,375, as a portion of the estate has been purchased by the Ministry of Agriculture and Fisheries for the purpose of land settlement. The Society is now in a position to repay these loans, as it has sold the estate to a new company called "Home Grown Sugar, Ltd."

Coke Export in February

Major Barnes asked the President of the Board of Trade (House of Commons, March 15) if, in view of the high prices which were now being paid for gas coke and foundry coke for export, he would inform the House of the total export of coke during February; the average price per ton; the average amount of coal required to produce 1 ton of coke; and the average price of such coal per ton to the producer of coke?

Mr. Bridgeman: During February 80,320 tons of gas coke and 149,914 tons of coke of other sorts were exported, and the average value per ton f.o.b. was £4. 13s. 9d. for gas coke and £5. 0s. 6d. for other sorts of coke. The average amount of coal required to produce 1 ton of coke is not precisely known, but it is usually assumed that 5 tons of coal are consumed for every 3 tons of coke made. The average price of coal used either for coke or gas making in this country cannot be stated.

Profiteering Act: Soap

Mr. Bridgeman, in reply to Major Barnes (House of Commons, March 15), said that investigations of the Sub-Committee appointed by the Standing Committee on Trusts of the Central Committee to inquire into the nature of any combination existing among soap manufacturers or distributors and the effect of any such combinations were still proceeding, and he was unable to say when the Sub-Committee would be in a position to render a report. He understood

that the retail price of yellow, carbolic and Sunlight soap was raised one farthing a pound during the month of February.

Dye Industry: Goodwill and Patents

Major Barnes asked the President of the Board of Trade (House of Commons, March 15) if, in view of the fact that the goodwill and patents of the British Dyes, Ltd., and Levensteins, Ltd., had been valued at £980,044, he would say whether this value depended upon the continued assistance of the Government being given to this industry; if so, whether this value should have gone to the State giving the assistance; and, if not, why assistance should be given to companies whose goodwill and patents were declared to be of the value stated above?

Mr. Bridgeman: The value of the goodwill and patents of any industrial undertaking necessarily depends largely upon the amount of capital available for carrying on its operations. In this particular case it is not considered that the State is entitled to share in the value of the goodwill and patents, except in proportion to its participation in the whole subscribed capital of the company.

Sherboro Island Palm Oil Concession

Colonel Wedgwood asked the Under-Secretary of State for the Colonies (House of Commons, March 16) whether his attention had been drawn to a prospectus about to be issued, which claimed to have obtained an exclusive concession to deal in palm oil compression in the Island of Sherboro for 21 years; and whether this concession had received the sanction of the Government?

Lieut.-Colonel Amery: The concession referred to confers no other exclusive right, except that of erecting power mills for the expression of oil from palm fruit within the area specified. It confers no right to the trees or the fruit. The negotiations for the grant had been carried so far before the war that it was not thought just to refuse to confirm the grant when peace rendered it possible for the concessionaires to resume their operations.

Reparation Dyes

Lieut.-Colonel Pickering asked the President of the Board of Trade (House of Commons, March 17) if he was aware that the shortage of dye wares was becoming serious in the textile trade; and whether, as the French were in occupation of territory containing German dyeworks, they were getting more than their fair share of dyestuffs?

Mr. Bridgeman: The situation in respect of dyestuffs is receiving the constant attention of the Board of Trade. The allocation of the stocks of dyestuffs in Germany, so far as the Allies have a claim on them by way of reparation, is a matter for the Reparation Commission which, I understand, has made every effort to establish a basis of allocation which is fair to all the Allied countries concerned.

Lead and Zinc Prices

Mr. W. Thorne asked the Minister of Labour whether any industrial council existed in the lead and zinc mining industry; if not, whether he would avail himself of Part II. of the Industrial Courts Act to institute an inquiry into the recent rises of lead from £37 per ton in November, to over £50 per ton (English pig) to-day, and the relation this advanced price bore to the wages of lead miners; and whether, as spelter had advanced in a similar period from about £46 per ton to an average of about £60 per ton, he would extend the inquiry into the remuneration of blend miners and, if possible, form an industrial council for these two industries.

Sir R. Horne: No Joint Industrial Council exists for either of the industries, though there is an Interim Industrial Reconstruction Committee for the non-ferrous mines industry, which is primarily connected with lead and zinc mining. An inquiry into the economic position of non-ferrous mining in this country is already being conducted, and a concurrent inquiry on the subject is accordingly unnecessary and inadvisable.

Tin Prices

Mr. W. Thorne asked the Minister of Labour (House of Commons, March 17) whether his attention had been drawn to the statement in the press that on November 3 last the price of tin (standard cash) was £273 per ton, and that it rose by rapid stages to £423 per ton on February 25, and was still over the £400 limit and stood at a figure higher than tin had ever reached in its history; that the position in Cornwall to-day was that the miners were not being paid a fair rate of wages compared with the increase which other branches of workers were receiving; whether the industrial council of the tin trade had had before it demands for increased wages for over a month and had come to no settlement; whether the return of tin miners' wages in the February issue of the *Labour Gazette* only revealed average weekly earnings of £2. 6s. 6d. per man per week; and whether, in view of this apparent refusal of the tin mine proprietors of Cornwall to pay their men an adequate wage, he would, in view of the profits now being made, at once set up an Industrial Council inquiry.

Sir R. Horne: I am informed that negotiations are proceeding between the Tin Mining Employers' Federation and the Workers' and Dock, Wharf, Riverside and General Workers' Unions, that an offer of certain increased wages has been made to the unions, and that a ballot on it is taking place. In the circumstances, I do not think my department should intervene in this matter at the present stage.

From Week to Week

SIR JAMES DEWAR has been appointed Corresponding Member of the French Academy of Sciences.

MR. ARTHUR R. LING has been appointed to the Adrian Brown Professorship of Chemistry in the University of Birmingham.

DR. STEPHEN MIALL has been appointed Co-secretary and Treasurer of the Federal Council for Pure and Applied Chemistry.

PROFESSOR R. WILLSTATTER, of Munich, is reported to have declined the offer of the Chair of Chemistry in the University of Berlin.

THE GERMAN POTASH SYNDICATE reports production of potash for 1919 at 946,000 short tons, of which 264,000 tons were sold abroad.

THE DEATH OCCURRED at Windermere on Monday, of Mr. A. J. King, a well-known Manchester cotton mill owner, and a director of the Bleacher's Association.

MR. STEPHEN FURNIVAL, of Sheffield—a partner in the firm of Eardley & Furnival, Glossop Road—has been appointed examiner in pharmacy and materia medica in London to the Pharmaceutical Society of Great Britain.

DAMAGE ESTIMATED at £1,000 was caused on Sunday by a fire which broke out in the chemical works of James Ross & Co., Dawsholm Road, Maryhill, situated beside the Glasgow Corporation Dawsholm Gas Works. It appears that a tar-distilling retort burst, and the contents took fire and spread to two tar vats, each measuring about 80 ft.

THE RADIUM LODGE, No. 4,031, the membership of which will be composed of analytical and manufacturing chemists, was consecrated on Friday, March 12, at Freemason's Hall, W.C., by the Grand Secretary of England, Mr. P. Colville Smith. Mr. Arthur Ross, L.R., was installed as the first Master, with Messrs. A. Gordon Craig and Nicholas J. Bluman as Wardens. Dr. W. R. Hodgkinson was appointed Secretary.

AT A PUBLIC MEETING held on Friday, March 12, in connection with the appeal for £1,000,000 for Liverpool University, Dr. Adam, Vice-Chancellor, said that if this country had spent £100,000,000 30 years ago on chemical research and university training Germany would not have had quite such a swelled head and been so confident of winning the war because of her superior science. Some of the laboratories at the University had been in existence since 1881 and were lamentably incomplete, and for this alone they needed £350,000.

THE SUM OF £25,000 has been allotted from the Sir William Ramsay Memorial Fund towards the erection of a Ramsay memorial laboratory of chemical engineering on a site which the Senate of the University of London had undertaken to provide. The total sum required for the building and equipment is £50,000, and in a letter signed by, among others, Lord Glenconner, Mr. Asquith and Mr. H. A. L. Fisher, Minister of Education, an appeal is made to chemical and engineering firms. The honorary treasurers are Lord Glenconner and Professor J. Morgan Collier.

IN HIS PRESIDENTIAL ADDRESS to the Institute of Metals on 11th inst., Engineer Vice-Admiral Sir George Goodwin bore testimony to the good work accomplished during the war by practical scientists, notably metallurgists and chemists specialising in oils, in connection with naval machinery. They had assisted with unrivalled ability to an extent for which the Navy and the country must be for ever grateful. In a plea for co-operation he mentioned that petroleum experts could be consulted with much advantage when dealing with the combined problems that arose in the development of the internal combustion engine. Co-operation with them, therefore, should be facilitated as much as possible.

AS THE RESULT of a terrific explosion which occurred at the Alpha Chemical Works, Denton, near Manchester, on Tuesday, two workmen, Walter Lane of Droylsden, and John Shields, of Manchester, were killed, and at least one other, Frederick Langdon, was seriously injured. The works belong to H. N. Morris & Co., Ltd., a well-known firm of chemical manufacturers. The explosion caused extensive damage in the building plant and chemicals, and several huge tanks in an adjoining building narrowly escaped. The plant on which the men were working had not been used for over 12 months, and no explanation can be offered at present as to the cause of the explosion.

AT THE LAST MEETING of the General Committee of the British Chemical Trade Association the resignation by Mr. S. J. C. Mason of the post of honorary secretary was accepted, and Mr. O. F. C. Bromfield, the assistant secretary, was appointed to succeed him. Mr. Mason, who is well known in the chemical trade, took an active part in the establishment of the Association and has acted as hon. secretary from the beginning. On his resignation, he was elected a member of the committee. Mr. Bromfield, who now becomes general secretary of the Association, accepted the post of assistant secretary on his return from active service. He has worked hard to extend the membership and work of the Association and has done much useful work in negotiations with Government departments and in securing their co-operation and recognition.

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ALLOYS. A model for representing the constitution of ternary alloys. W. Rosenhain. Inst. Metals, March 12 (advance copy), 8 pp.

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ALUMINIUM. The action on aluminium of hard industrial waters. R. Seligman and P. Williams. Inst. Metals, March 11 (advance copy), 26 pp.

ANALYSIS. Machine for washing precipitates. E. Sinkinson. *Analyst*, March, 94-97.

BRASS. The art of casting in high tensile brass. N. J. Maclean Inst. Metals, March 12 (advance copy), 18 pp.

The removal of internal stress in 70:30 brass by low temperature annealing. H. Moore and S. Beckinsale. Inst. Metals, March 12 (advance copy), 11 pp.

COPPER. Influence of cold rolling on the physical properties of copper. F. Johnson. Inst. Metals, March 12 (advance copy), 31 pp.

The effect of progressive cold drawing upon some physical properties of commercially pure copper. W. E. Alkins. Inst. Metals, March 12 (advance copy), 62 pp.

Some notes on the effects of hydrogen on copper. W. C. Hothersall and E. L. Rhead. Inst. Metals, March 12 (advance copy), 10 pp.

Idiomorphic crystals of electro-deposited copper. W. E. Hughes. Inst. Metals, March 12 (advance copy), 14 pp.

DYES. Colour manufacture and modern tendencies in dyeing. C. M. Whittaker. *J. Text. Inst.*, March, 64-67. The difficulties of establishing a dye industry are dealt with, and notes given on recent progress in the dyeing industry.

GAS. An investigation into the composition of the unsaturated hydrocarbons present in coal gas. F. S. Sinnatt and L. Slater. *Analyst*, March, 85-88. The proportions of ethylene, propylene, butylene and amylene are given, as well as a method for estimating these compounds.

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LUBRICATION. The theory and practice of lubrication: the "germ" process. H. M. Wells and J. E. Southcombe. *J. Soc. Chem. Ind.*, March 15, 51-60T. (*See* CHEMICAL AGE, 1920, 150.)

MUSTARD GAS. A synthesis of ββ-dichlorodiethyl sulphide (mustard gas). J. E. Myers and H. Stephen. *J. Soc. Chem. Ind.*, March 15, 65-66T.

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The action of nitric acid on saponifiable oils. L. G. Radcliffe and C. Polychronis. *J. Soc. Dyers & Col.*, March 65-76. An interesting research on the vitiation of oils.

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AEROPLANES. The construction and covering of aeroplane wings. A. Fuchs. *Chim. et Ind.*, February, 167-172. An account of the materials used for making the wings, including "dopes."

DISTILLING. Distillation and rectification. L. Gay. *Chim. et Ind.*, February, 157-166. A valuable Paper dealing with thermal and chemical aspects of the subject.

FURNACES. The heating of metallurgical furnaces with heavy oil. A. Goudy. *Chim. et Ind.*, February, 143-156. A useful account of oil-fired furnaces, with illustrations.

KIESELGUHR. The industry of infusorial and diatomaceous earths. A. Bigot. *Rev. de l'Ing.*, February, 301-326. The properties and uses of the earths are discussed, and an account of European deposits is given.

METHYLHALIDES. The preparation of methyl chloride and methyl bromide from dimethyl sulphate. C. Boulin and L. J. Simon. *Comptes rend.*, March 8, 595-597.

United States

COKE. Coke oven accidents in the United States during 1918. A. H. Fay. *U.S. Bureau of Mines, Tech. Paper*, 239, 26 pp. The various accidents are classified.

EXPLOSIVES. Sensitiveness of explosives to frictional impact. S. P. Howell. *U.S. Bureau of Standards, Tech. Paper*, 234, 17 pp. A pendulum friction device is described, and an account given of tests made with it.

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LEAD. The vapour pressure of lead chloride. E. D. Eastman and L. H. Duschak. *U.S. Bureau of Mines, Tech. Paper*, 225, 16 pp

ORES. War minerals, nitrogen fixation, and sodium cyanide. V. H. Manning. *U.S. Bureau of Mines, Bull.* 178B, 61 pp. An account of some of the work done in these directions by the Bureau during the war.

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VARNISHES. A new method for determining the acid values of varnishes and boiled oils. H. A. Gardner and R. E. Coleman. *Circ.* 87, *Paint Manufs. Assoc., U.S.*, 9 pp.

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ALUMINIUM. The polishing of aluminium. L. von Grotthuss. *Metall. u. Erz.*, January 22, 39-40. Polishing is recommended as a means of protecting the metal against water.

ANALYSIS. Apparatus for extracting liquids. K. Brauer and E. W. Ebert. *Chem. Zeit.*, March 11, 214. An apparatus of the Soxhlet type is described.

CHLOROFORM. The testing of chloroform. Utz. *Pharm. Zentralh.*, January 4, 1-5. Tests for various impurities are described.

COPPER. The standardisation of copper. O. Nielsen. *Metall. u. Erz.*, Jan. 8, 4-10. Suggestions for various standards are put forward.

EXPLOSIVES. Tabular review of the Patents which have appeared during the war in connection with explosives. *Z. ges. Schiess-u. Sprengstoffw.*, No. 5, 66-68. Continuation of article already noted (CHEMICAL AGE, 1920, 284).

FATS. The synthesis of fats. W. Fabrion. *Chem. Umschau.*, Vol. 27, No. 4, 25-26. The possibility of the technical synthesis of fats is considered.

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GLASS. Standardisation of glass apparatus. F. Friedrichs. *Z. angew. Chem.*, March 2, 56.

MAGNESIA. Magnesia masses. A. Berge. *Sprechsaal*, January 1 and 8, 1-3, 9-11. A description of various magnesia compositions for building, &c.

MEASURING. The measurement of water and gas flow. A. Hinz. *Gluchauf*, January 31, 85-91.

NITRIC ACID. Catalytic oxidation of ammonia to nitric acid. B. Neumann and H. Rose. *Z. angew. Chem.*, March 2, 51-55. Final instalment of Paper already noted (CHEMICAL AGE, 1920, 258), dealing with the use of oxide catalysts.

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PICRIC ACID. The toxicity of picric acid. F. Koelsch. *Z. ges. Schiess-u. Sprengstoffw.*, No. 5, 63-65.

SULPHUR. The sulphur supplies of Germany. O. F. Kaselitz. *Z. angew. Chem.*, March 2, 49-51. The Paper deals specially with the utilisation of the sulphur in gypsum.

ZINC. Progress in the electrometallurgy of zinc. F. Peters. *Gluchauf*, January 24 and 31 and February 7, 61-68, 91-96, 107-113. A useful review of modern processes.

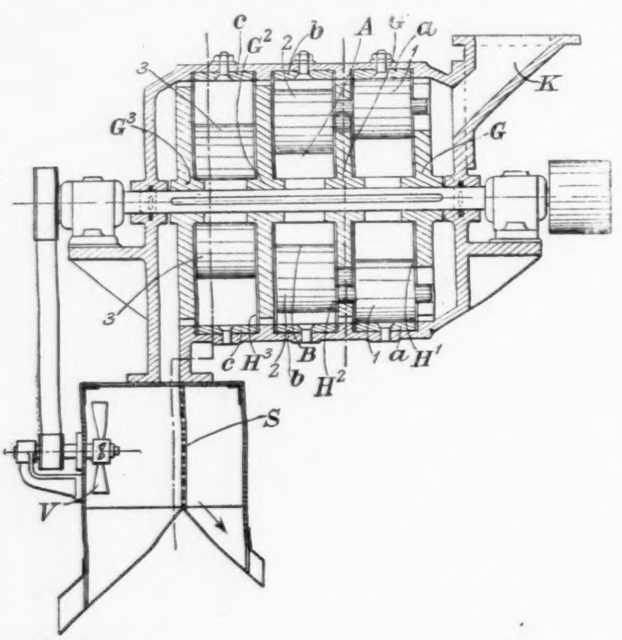
Patent Literature

We publish each week a list of selected complete specifications accepted as and when they are actually printed and on sale. In addition, we give abstracts within a week of the specifications being obtainable. Readers can thus decide what specifications are of sufficient interest to warrant purchase, the only way of obtaining complete information. A list of International Convention specifications open to inspection before acceptance is added, and abstracts are given as soon as possible.

Abstracts of Complete Specifications

13,878/1914. GRINDING CRUSHING OR PULVERISING MACHINE. O. Wauthier, 131, Avenue Albert, Brussels, Belgium. Application date, June 8, 1914.

The machine is intended for minerals of varying degrees of hardness, such as pyrites, chalk, limestones, emery, sand, stone, porphyry, phosphates, superphosphates, ochres, flint, glass, quartz, coal, &c. The machine is composed of an outer frame in two parts, A and B, which are connected together by a horizontal hinge at each side to allow easy access to the interior. The driving shaft carries four hard steel discs G, G′, G², G³, forming three compartments H′, H², H³. Each disc

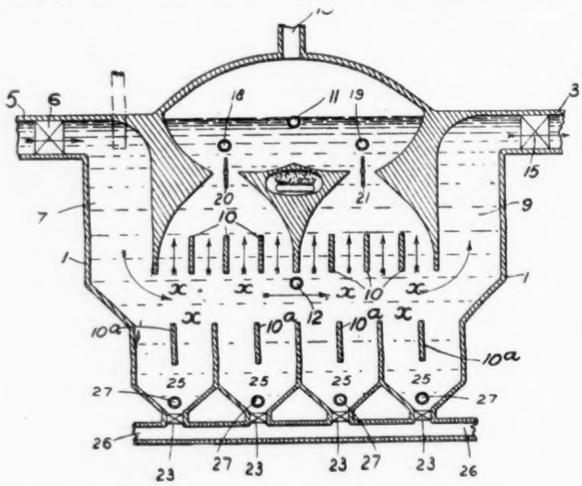


13,878

is provided with a number of radial slots arranged around its circumference to form bearings for the pins of hard steel rollers 1, 2, 3, which are free to rotate between the hard steel discs and also to move radially in the slots. The material is fed into the hopper K and is ground between the rollers, which are carried outwards by centrifugal force, and the hard outer rings *a*, *b*, *c*. Another series of slots is cut in each steel disc to hold movable radial scrapers set obliquely so that the substance to be ground is transferred successively through the compartments H′, H², H³. The ground material is finally blown through a screen S by means of a fan V driven from the main shaft.

138,655. SEPARATING OR SEPARATING AND RECOVERING (AND IF DESIRED WASHING) OIL, GREASE, FAT, OR FATTY MATTER OR THE LIKE, OR OTHER MATERIAL, FROM WATER OR OTHER LIQUIDS, METHOD OF AND APPARATUS FOR—OR FOR THE SEPARATION OF TWO LIQUIDS OF DIFFERENT DENSITIES. L. Linden, 242, Finchley Road, Hampstead, London, N.W.3. Application date, July 19, 1918.

Liquid to be treated enters the separating chamber 1 through the inlet pipe 5 controlled by valve 6, and passes downward through the passage 7 to the horizontal zone *x* and thence to the outlet passages 9 and 3, controlled by the valve 15. Baffle plates 10 extend across the chamber 1 at right angles to the current of liquid so as to define the upper level of its path and separate the lighter constituents which rise upward between the baffle plates. A discharge pipe 11 is provided for the lighter constituents which may be tapped off periodically to a predetermined depth by closing the valve 6 and supplying fresh liquid through the pipe 12, or by controlling the outflow through the valve 6. If the separated lighter material is too thick to discharge readily it may be expelled through the pipe 13 by closing the valves 6, 15, and admitting liquid through the pipe 12. A transverse passage 16 may be provided with

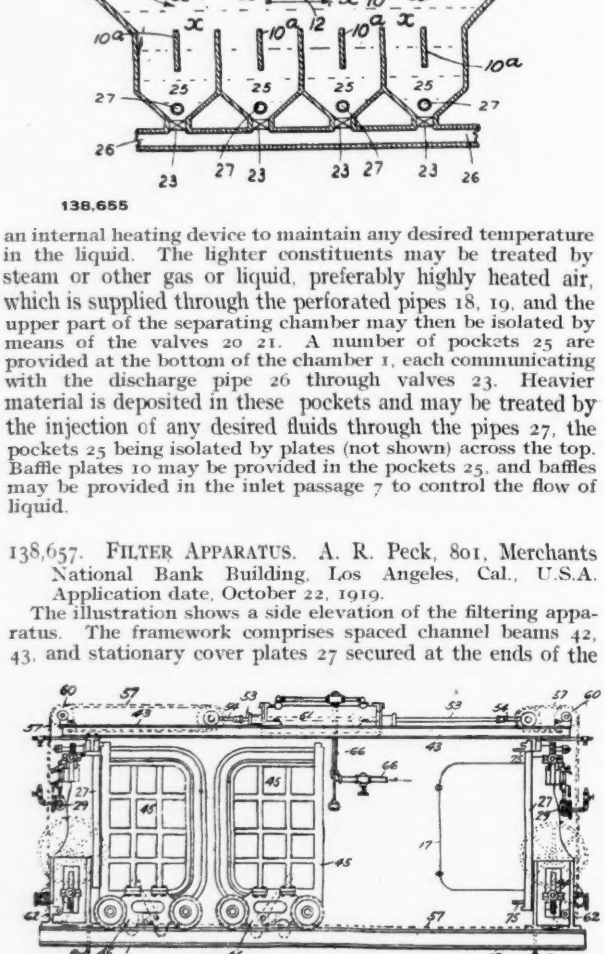


138,655

an internal heating device to maintain any desired temperature in the liquid. The lighter constituents may be treated by steam or other gas or liquid, preferably highly heated air, which is supplied through the perforated pipes 18, 19, and the upper part of the separating chamber may then be isolated by means of the valves 20 21. A number of pockets 25 are provided at the bottom of the chamber 1, each communicating with the discharge pipe 26 through valves 23. Heavier material is deposited in these pockets and may be treated by the injection of any desired fluids through the pipes 27, the pockets 25 being isolated by plates (not shown) across the top. Baffle plates 10 may be provided in the pockets 25, and baffles may be provided in the inlet passage 7 to control the flow of liquid.

138,657. FILTER APPARATUS. A. R. Peck, 801, Merchants National Bank Building, Los Angeles, Cal., U.S.A. Application date, October 22, 1919.

The illustration shows a side elevation of the filtering apparatus. The framework comprises spaced channel beams 42, 43, and stationary cover plates 27 secured at the ends of the



138,657

framework. The filtering chambers 45 are mounted on trucks 46, running on the channel beams 42, and are open only at the front. The chambers 45 are moved by means of the cylinders 51, which are mounted on the upper channel beams 43, through the medium of the piston rods 53, yokes 54, and sprocket chain 57, which passes over the sprocket wheels 60 and 62, and is connected to the truck 46. Means are provided whereby either chamber 45 can be disconnected so as to remain in place when the other chamber is moved. The cylinder 51 is operated by compressed air supplied through the pipe 66. One of the filtering units may thus be worked while the other is opened for cleaning. The filter leaves 17 are fixed to the cover plates 27, and the movable chambers 45 are secured to the cover plates by means of bolts 75 so as to enclose the filter leaves 17. The liquid to be filtered is admitted to the chamber 45 through the inlet pipes 104, and the filtered liquid is discharged through the pipes 29. The details of construction and the method of working are fully described.

138,679. ACETONE, PROCESS OF MANUFACTURING. H. W. Matheson, Shawinigan Falls, Quebec, Canada. Application date, January 23, 1919.

The process is for the preparation of acetone from acetic acid, more particularly that obtained from acetylene, and the invention consists in the use of a special material for supporting the catalyst. This material consists of metal balls of 1 in. to 2 in. in diameter, these balls being coated with a catalyst preferably consisting of lime 75 per cent. to 95 per cent., magnesia 25 per cent. to 5 per cent., and water to form a paste. The balls are dipped in this paste and packed into the reaction tube which is then heated and a current of air passed through to remove moisture from the catalyst. The temperature is then raised to about 500°C., and acetic acid, preferably vaporised by steam heat, is passed through the tube and is converted into acetone, carbon dioxide, and water vapour. The gases are passed through condensers cooled by running water which condense the water vapour and most of the acetone, and the residual gas is then passed through a water scrubber to remove the remainder of the acetone. The acetone is then refined, and a high yield of 85 per cent. to 95 per cent. is obtained. The catalytic material may alternatively consist of the oxide or hydroxide, carbonate or acetate, of any of the metals the acetates of which are capable of conversion into acetone by the action of heat.

138,762. KILNS AND THE LIKE, FURNACES FOR. J. Nash, St. Anns, Cliff Road, Westcliff, Essex. Application date, April 9, 1919.

The object is to produce a more complete combustion of the fuel and to prevent smoke. The furnace is provided with an arch over the grate extending from the back of the furnace about two-thirds of the distance towards the front, and open at the front. Another arch is provided over the first arch and extending from the back of the furnace about half-way towards the front. Fires are maintained on the grate and also on the first arch and these fires are stoked alternately so that some part of the fire is always incandescent, to consume smoke and generate gas.

138,796. TANNING MATERIALS, MANUFACTURE OF—FROM FORMALDEHYDE AND AROMATIC DERIVATIVES. A. G. Bloxam, London. (From Durand and Huguenin Soc. Anon., Basle, Switzerland). Application date, May 27, 1919.

Compounds having a high tanning value are obtained by condensing with formaldehyde or a substance which develops formaldehyde a 1- or 2-aminonaphthalenemono- or disulphonic acid or a mixture of these acids and an aromatic oxy-derivative which contains at most one hydroxyl group per nucleus, but also one or more salt-forming acid groups. In one examples 20 parts of β-naphthol are sulphonated at 105°C. with 30 part, of strong sulphuric acid of 66° Bé, and the mixture is dissolved in 100 parts of water and 42 parts of sodium 2: 6: 8-naphthylamine disulphonate are added. The mixture is then heated to 70°C. and 15 parts of formaldehyde of 30 per cent. strength and 45 parts of water are added. The product is a tanning material which may be improved by adding 71 parts of aluminium hydrate and then 8 parts of anhydrous sodium carbonate of 98 per cent. strength. The final product contains about 26 per cent. of tanning substance and about 67 per cent. of water, the remainder being non-tanning substances. In a modification, the naphthol is replaced by cresols, and in another modification the aluminium hydrate may be replaced by chromium hydroxide or iron hydroxide. These modifications are described in detail. These compounds possess the property of imparting a yellow colour to leather in addition to their tanning action.

138,802. RABBLES OR OTHER AGITATORS OR STIRRERS. W. H. Sayre, Glen Ridge, Essex County, N.J., U.S.A. Application date, June 11, 1919.

The object is to prevent wear of the surfaces of rabble blades employed in ore roasting furnaces, pug mills, &c. The blade is made of cast-iron and contains a number of transverse plugs of hard material such as alundum, which pass right through the blades and project slightly on each side. The plugs may be arranged in groups or in rows; or when embodied in a paddle blade for use in pug mills the plugs may be arranged along the outer edges of the blades.

NOTE.—Specification 129,292 relating to liquefying gases, which is now accepted, was abstracted when it originally became open to inspection under the International Convention. *See* THE CHEMICAL AGE, Vol. I., page 370.

International Specifications Not yet Accepted

137,513. ZINC OXIDE. New Jersey Zinc Co., 160, Front Street, New York. (Assignees of J. A. Singmaster, Bronxville, New York; and F. G. Breyer and A. E. Hall, Palmerton, Pa., U.S.A.). International Convention date, January 8, 1919.

A mixture of coal and zinc or lead-zinc ore is placed on a bed of ignited fuel, and air is blown through to produce zinc oxide. The coal, ore, or ignition fuel is in the form of briquettes of double pyramidal form of 1·75 in. side. The ore and reducing fuel may be briquetted together, and the ignition fuel briquettes may contain some ore. The ingredients are mixed with sulphite cellulose liquor as a binding agent, compressed at a pressure of 2,000 lb. per square inch, and the briquettes then dried and baked in a tunnel drier at 200°C. The air blast is used at a lower pressure than usual.

137,514. OILS, EXTRACTING AND PURIFYING. P. M. F. Heyerdahl, Hays Pensionat, Bygdo, near Christiania. International Convention date, January 9, 1919.

The process is more particularly for extracting and purifying cod-liver and other fish oils. The oil or material is boiled at about 75°C. with fresh, salt, acid, or alkaline water under vacuum, and low temperature steam with or without other inert gas may be injected into the mixture. The inert gas may be hydrogen, carbon dioxide, nitrogen or water vapour, or a mixture of these.

137,519. POTASSIUM SULPHATE. Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, Alsace. International Convention date, December 30, 1918.

Finely powdered potassium chloride is mixed with 70 per cent. sulphuric acid in quantity just sufficient to convert it into potassium sulphate. The mixture should remain pulverulent, and acid of weaker strength may be used if sufficient potassium sulphate is dissolved in it to keep the mixture pulverulent. Alternatively, the sulphuric acid may be replaced by a solution of potassium bisulphate of suitable strength, or by a solution of potassium bisulphate in dilute sulphuric acid. The mixture is heated to 100° to 120°C. in a muffle with stirring, and about half the theoretical amount of hydrochloric acid is evolved and is condensed. The mixture is then heated to 300°C., and finally to 700° to 800°C., to release the remainder of the hydrochloric acid, the material being retained in the muffle or transferred to the pan of a salt-cake furnace. The sulphuric acid is preferably used in slight excess to complete the reaction, and this acid is liberated at the end of the reaction and is recovered in a washing tower containing sulphuric acid.

137,529. UTILISING WASTE EXPLOSIVES. E. Bielouss, 1845, B Street, Washington, U.S.A. International Convention date, January 6, 1919.

Aromatic nitro explosives are treated with reducing, oxidising, halogenating or other reagents to convert them into non-explosive compounds. Processes are described for re-

ducing trinitrotoluene with iron and acid, or with ammonium sulphide; trinitrotoluene may be oxidised to trinitrobenzoic acid by fuming nitric acid or to "trinitrohydroxy-toluol" by caustic soda. Trinitrotoluene may also be treated with butyl alcohol to produce 2:4:6- trinitro-3-butyltoluene, and halogenation processes are also described. Other explosives such as tetryl, dinitrobenzene, "explosive D," ammonium picrate, picric acid, trinitro-cresol, amatol, &c., may also be treated.

137,540. ELECTRIC FURNACES. Booth Electric Furnace Co. (Successors to Booth-Hall Co.), 53, West Jackson Boulevard, Chicago, U.S.A. (Assignees of J. R. Hall, Oak Park, Ill., U.S.A.). International Convention date, April 4, 1918.

An auxiliary door is provided for an electric furnace and carries an adjustable electrode to be used as a substitute for the hearth or wall electrode before these become conducting by the rise in temperature. The main door is attached to horizontal pivots so that it may be raised out of the way when the auxiliary door is in use. The auxiliary door is in the form of a water-cooled plug having an inclined recess for the electrode which is supported on an inclined carriage in front of the door. The electrode may be withdrawn axially by means of rack and pinion mechanism, and its supporting carriage is supported on vertical pivots attached to the furnace, so that the electrode may be swung out of position when withdrawn. The whole of the mechanism for substituting one door for the other and retaining either door in disengaged position is described in detail.

137,541. COLD AND HEAT-RETAINING VESSELS. Isola Ges. für Warme und Kalte-Isolierung, 26, Schlesichestrasse, Berlin. International Convention date, October, 3, 1915.

Large vacuum vessels for storing liquid air, &c., having a capacity of over 5 litres are constructed with their glass walls more than two millimetres thick. Immediately after fusing together the inner and outer vessels at the neck, the vessel is inserted into a metal or asbestos casing previously heated to 400° to 500°C., and then transferred to an oven where it is heated to 700° to 800°C. The oven is then allowed to cool slowly and the vacuum vessel is subsequently treated in the usual manner.

LATEST NOTIFICATIONS.

139,753. Perborates. Manufacture of. Fredriksstad Elektrokeniske. Fabriker Aktieselskabet F.E.F. March 4, 1919.

139,758. Gas Purifying Apparatus. C. Bourdon. March 6, 1919.

139,776. Soaps and Washing Materials. Manufacture of. C. H. Boehringer Sohn. November 21, 1918.

139,803. Acid Phosphate. Manufacture of. Chemical Construction Company. March 4, 1919.

Specifications Accepted, with Date of Application

122,188. Vulcanised Rubber, Process for Regenerating. S. van Raap. January 8, 1918.

122,819. and 128,181. Aromatic Arsenical Compounds. Rockefeller Institute for Medical Research. January 28, 1918, and June 13, 1918.

138,946-954. Zinc solutions, Purification of. S. Field and Metals Extraction Corporation. May 22, 1918, and November 16, 1918.

138,947-8. Zinc Solutions, Purification of. H. L. Sulman, S. Field and Metals Extraction Corporation. May 28, 1918.

138,950. Metallic Solutions, Purification of. S. Field and Metals Extraction Corporation. June 28, 1918.

138,999. Aldehydes, Manufacture of. A. I. Appelbaum. February 19, 1919.

139,005. Alumina, Manufacture of. K. J. P. Orton and G. W. Robinson. February 26, 1919.

International Convention Patents

It is officially announced that the provisions of Section 91 of the Patents and Designs Act, 1907, as amended by the Acts of 1914 and 1919, relating to the grant of patents with priority of date under the International Convention, will be applicable to Czecho-Slovakia as from October 20, 1919.

DR. BERNARD MORE, a director of the Mond Nickel Co., since its inception in 1900, was taken ill whilst attending a directors' meeting at the company's offices in London on Thursday, March 11, and died at his residence at Hampstead the following day.

The British Dye Industry

THE American Chamber of Commerce in London indicates that there seems a definite fear among the colour-using trades of the United Kingdom lest the British dye industry concentrate on the production of the commoner kinds of dyes to the neglect of the finer qualities and a wide range of varieties.

It is claimed that thousands of dyes made in Germany are not being manufactured in Britain, and while all these are not essential dyes, they indicate that there is a far wider range of production in the German dye industry. British colour-users complain that the dye industry in Britain is a virtual monopoly, and is not paying sufficient attention to the requirements of the colour-using trades, particularly in the matter of fine dyes.

It is fully admitted, says the Chamber, that many chemicals never before manufactured are being produced in Britain, but many more remain to be dealt with, as all the synthetic chemicals, whether dyes, drugs, &c., are associated in manufacture. This view receives some support from the recent Board of Trade Order prohibiting export from the United Kingdom of all coal tar products which form the basis of dyes and most chemicals.

Criticising the Government's Anti-Dumping Bill, the Manchester Chamber of Commerce considered that the measure would not meet the requirements of British national security, and would be detrimental to research and development of the industry. The Government, it was said, should specify the amount of chemical plant essential to secure national safety, and should bear a share of the cost of keeping that amount of plant in commission, adding that British colour-users were prepared, also, to bear a proportion of the cost, with the stipulation that there should be as little difficulty as possible in the way of securing necessary dyes from abroad.

The official estimate of the approximate quantities and values of potash compounds imported from Germany and Alsace into Britain since the armistice for purely industrial, as apart from agricultural, purposes are as follows: From Germany, 4,301 tons, valued at £182,448; and from Alsace, 100 tons, valued at £2,250. It is not known at what prices other German potash compounds have been sold to British purchasers.

Lord Leverhulme on Combines

LORD LEVERHULME, at the annual shareholders' meeting of Lever Brothers last week, referred to big trading combinations as tending to greater efficiency of service to the public and to keeping prices low. Apparently, however, judging by recent events, the public hated what they called combines more than they loved the economies which combination secured. The price of soap secured by Lever Brothers' combination had made possible a lower percentage of advance in the United Kingdom than in any other country in the world. Referring to the position of British credit, he drew a comparison between national and industrial finances, and declared that Government securities had fallen to a much greater extent than industrial securities. If the public were exhibiting more confidence in the ability and management behind industrial organisations than in the character of Government securities, then that showed that the national credit had received a shaking which was reflected at each fresh inquiry on the subject of nationalisation, as well as by experience of and disclosures in reference to Government control.

Casson Compositions (South Africa), Ltd.

THE first meeting of the creditors and shareholders in the compulsory liquidation of Casson Compositions (South Africa), Ltd., 11, Craven Hill, Paddington, W., was held on Tuesday at the Board of Trade offices, 33, Carey Street, W.C. A statement of affairs showed liabilities of £2,846. 9s. 8d., and assets valued at £2,441. As regards shareholders a deficiency of £2,491. 14s. 3d. was disclosed. The company was promoted in August, 1918, by the Casson Compositions Co., Ltd., to acquire the proprietors' rights to manufacture and sell in South Africa certain paints and compositions invented by Mr. Casson. The purchase price was agreed at £5,000 in shares, and the nominal capital was fixed at £20,000, of which £2,252 was subscribed for cash. The company expended £2,600 on setting up a factory in Durban, and in May, 1919, Mr. Casson shipped stock to the value of £1,495 to enable the company to carry on until it was in a position to manufacture on its own account. Soon afterwards disagreements arose on the board of the parent company and Mr. Casson severed his connection with it. The South African Co. exhausted its funds and eventually a winding-up order was made on the petition of the parent company.

The liquidation was left in the hands of the Official Receiver.

The New Chemical Company

AT the first meeting of creditors of the New Chemical Co., Ltd., the Union Chemical Works, Rusholme, Manchester, held on March 9, at the Official Receivers' Offices, in Manchester, Mr. F. Murgatroyd, the Assistant Official Receiver, presiding, it was stated that no statement of affairs had been prepared or filed, and therefore there were no figures available. No liquidator was appointed, the matter being left in the hands of the Official Receiver (Mr. J. Grant Gibson).

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co. and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

British Market Report

WEDNESDAY, March 17.

Trade has been very active this week and quite a good volume of business has been transacted, markets continue generally firm with small variations in value. The export position continues much the same, and there is an increasing demand on Continental account.

General Chemicals

ACETONE is in good request without change in value.

ACID ACETIC.—Makers are holding off the market to a large extent until the Acetate of Lime position is known.

ACID BORIC is without change, but substantial premiums are offered for any resale parcels that appear.

ACID CARBOLIC is nominally without change, but supplies are at a low level.

ACID FORMIC is in very good request.

ACID OXALIC.—English makers hold firmly to their quotations, and there is practically no foreign material arriving.

ACID TARTARIC has again been very active.

BARIUM SALTS are quite brisk, and without any substantial change in value.

COPPER SULPHATE is easy, and the price shows a slight falling off.

FORMALDEHYDE is practically unobtainable on the market, and very fancy prices are being paid for the few odd quantities that do appear.

IRON SULPHATE is without change, and quite a fair number of orders have been placed for export.

LEAD ACETATE WHITE is extremely firm, and inclined to go higher.

LITHARGE is without change, and makers are very fully booked.

LITHOPONE is still on the quiet side, but the value is firmly maintained, and arrivals are only moderate.

MAGNESIUM SALTS are all very active, but prices generally are without change.

POTASSIUM BICHROMATE.—Makers are very heavily sold, and high premiums are being paid for any resale parcels that appear.

POTASSIUM CARBONATE is moving off very well.

POTASSIUM CHLORIDE is on the fall, and the price is nominally without change.

POTASSIUM PERMANGANATE is extremely difficult to obtain on the spot, and the price is fully maintained.

POTASSIUM PRUSSIATE is harder, and a very active business has been transacted.

SODIUM ACETATE is somewhat scarce, and the price well maintained.

SODIUM BICHROMATE is still in extremely short supply, and heavy premiums on makers' prices are being paid for spot delivery.

SODIUM BISULPHITE is without change in position and price.

SODIUM CHLORATE is slow of sale at last quoted figures.

SODIUM CAUSTIC.—A good trade continues to be transacted in this product, but there seems to be more material offering.

SODIUM HYPOSULPHITE has again advanced in price and is very scarce.

SODIUM NITRITE is practically unobtainable for near delivery, and sales have been made at still higher prices.

SODIUM PHOSPHATE is practically unobtainable for near delivery, but is offered for April-May delivery.

SODIUM PRUSSIATE is without change, but the price is very firmly maintained.

SODIUM SULPHIDE is almost unobtainable for near delivery, and orders are now being placed in America for deliveries to Continental ports.

ZINC SALTS continue in request, and the prices are showing an upward tendency.

Coal Tar Intermediates

This market is nominally without change, but in most cases continue in extremely short supply, although a few shipments are now commencing to arrive from America. These, however, up to the present are doing very little to relieve the position.

ALPHA NAPHTHOL.—A good business has been transacted in this material for forward delivery.

ALPHANAPHTHYLAMINE is in short supply, but one or two arrivals are expected very soon from America, which should help to remove the present scarcity in this country.

BETA NAPHTHOL is in much the same position, and supplies are still very scarce.

NAPHTHIONATE OF SODA is badly wanted, but makers are very heavily sold.

PARANITRANILINE is in perhaps slightly better supply, but is still very scarce.

PHTHALIC ANHYDRIDE is in better supply, but is very much in request.

Coal Tar Products

There is no very great change in price from last week.

90's BENZOL.—This price remains at about 2s. 5d. per gallon on rails.

CRESYLIC ACID.—Supplies are scarce, and the price for Pale 97-99 per cent. is 4s. 3d. per gallon, and for Dark 95-97 per cent. 4s. per gallon.

CREOSOTE OIL remains firm at about 10½d. to 11d. in the North and 11d. to 11½d. in the South.

SOLVENT NAPHTHA is monentarily easier, and is worth about 3s. 2d.

HEAVY NAPHTHA is difficult to obtain, and is worth 3s. 6d. per gallon.

NAPHTHALENE is in good demand, and supplies of the better qualities are very difficult to obtain. Crude is worth about £10 to £12, with refined at about £30 per ton.

PITCH.—The market remains firm with good demand, and makers are asking now 125s. to 130s. f.o.b., East Coast, with 135s. to 140s. f.o.b., London.

Sulphate of Ammonia

There is a good demand for Home consumption at the former prices.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	3	3	to	0	3	6
Acetone oil	ton	80	0	0	to	83	0	0
Acetone, pure	ton	92	0	0	to	95	0	0
Acid, Acetic, glacial, 99-100%	ton	105	0	0	to	110	0	0
Acetic, 80% pure	ton	85	0	0	to	87	10	0
Arsenic	ton	100	0	0	to	105	0	0
Boric, cryst.	ton	74	10	0	to	76	0	0
Carbolic, cryst. 39-40%	lb.	0	1	4	to	0	1	4½
Acid, Citric	lb.	0	6	0	to	0	6	3
Formic, 80%	ton	110	0	0	to	115	0	0
Gallic, pure	lb.	0	7	3	to	0	7	9
Hydrofluoric	lb.	0	0	7	to	0	0	8
Lactic, 50 vol.	ton	65	0	0	to	70	0	0
Lactic, 60 vol.	ton	80	0	0	to	85	0	0
Nitric, 80 Tw.	ton	38	0	0	to	40	0	0
Oxalic	lb.	0	2	6	to	0	2	7
Phosphoric, 1.5	ton	60	0	0	to	65	0	0
Pyrogallic, cryst	lb.	0	11	6	to	0	11	9
Salicylic, Technical	lb.	0	3	0	to	0	3	3
Salicylic, B.P.	lb.	0	3	9	to	0	4	0
Sulphuric, 92-93%	ton	7	10	0	to	8	0	0
Tannic, commercial	lb.	0	5	0	to	0	5	3
Tartaric	lb.	0	3	9	to	0	3	10
Alum, lump	ton	19	10	0	to	20	0	0
Alum, chrome	ton	93	0	0	to	95	0	0
Alumino ferric	ton	9	10	0	to	10	0	0
Aluminium, sulphate, 14-15%	ton	15	0	0	to	15	10	0
Aluminium, sulphate, 17-18%	ton	18	10	0	to	19	0	0
Ammonia, anhydrous	lb.	0	1	9	to	0	2	0
Ammonia, .880	ton	35	0	0	to	37	10	0
Ammonia, .920	ton	20	0	0	to	24	0	0
Ammonia, carbonate	lb.	0	0	7½	to		—	
Ammonia, chloride	ton	95	0	0	to	97	10	0
Ammonia, muriate (galvanisers)	ton	52	0	0	to	54	0	0
Ammonia, nitrate	ton	60	0	0	to	65	0	0
Ammonia, phosphate	ton	135	0	0	to	140	0	0
Ammonia, sulphocyanide	lb.	0	2	3	to	0	2	6
Amyl, acetate	ton	360	0	0	to	370	0	0
Arsenic, white, powdered	ton	80	0	0	to	85	0	0
Barium, carbonate	ton	13	10	0	to	14	10	0
Barium, carbonate, 92-94%	ton	14	10	0	to	15	0	0
Chlorate	lb.	0	1	4	to	0	1	5
Chloride	ton	25	10	0	to	26	10	0

	per	£	s.	d.		£	s.	d.
Barium, Nitrate	ton	50	0	0	to	51	0	0
Sulphate, blanc fixe, dry	ton	25	10	0	to	26	0	0
Sulphate, blanc fixe, pulp	ton	15	10	0	to	16	0	0
Bleaching powder, 35-37%	ton	18	10	0	to	19	0	0
Borax crystals	ton	41	0	0	to	42	0	0
Calcium acetate, Brown	ton	18	10	0	to	20	0	0
„ Grey	ton	38	0	0	to	40	0	0
Carbide	ton	28	0	0	to	30	0	0
Chloride	ton	10	10	0	to	11	10	0
Carbon bisulphide	ton	58	0	0	to	59	0	0
Casein, technical	ton	80	0	0	to	83	0	0
Cerium oxalate	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	0	to	0	1	2
Cobalt acetate	lb.	0	7	0	to	0	7	6
Oxide, black	lb.	0	7	9	to	0	8	0
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	48	0	0	to	50	0	0
Cream Tartar, 98-100%	ton	300	0	0	to	305	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol.	ton	350	0	0	to	360	0	0
Formusol (Rongalite)	lb.	0	4	0	to	0	4	3
Glauber salts	ton	5	0	0	to	5	10	0
Glycerine, crude	ton	72	0	0	to	74	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	9	to	0	3	0
Iron perchloride	ton	40	0	0	to	42	0	0
Iron sulphate (Copperas)	ton	4	10	0	to	4	15	0
Lead acetate, white	ton	105	0	0	to	110	0	0
Carbonate (White Lead)	ton	75	0	0	to	78	0	0
Nitrate	ton	80	0	0	to	85	0	0
Litharge	ton	71	0	0	to	73	0	0
Lithophone, 30%	ton	60	0	0	to	62	0	0
Magnesium chloride	ton	15	10	0	to	16	10	0
Carbonate, light	cwt.	2	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	13	10	0	to	14	0	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate	ton	180	0	0	to	185	0	0
Sulphate	ton	80	0	0	to	82	10	0
Methyl acetone	ton	89	0	0	to	90	0	0
Alcohol, 1% acetone	gall.	Nominal						
Nickel ammonium sulphate, single salt	ton	47	10	0	to	52	10	0
Potassium bichromate	lb.	0	1	10	to	0	2	0
Carbonate, 90%	ton	102	0	0	to	105	0	0
Chloride	ton	Nominal.						
Potassium Chlorate	lb.	0	1	1	to	0	1	2
Hydrate, 88-90%	ton	115	0	0	to	120	0	0
Meta-bisulphite, 50-52%	ton	260	0	0	to	270	0	0
Nitrate, refined	ton	68	0	0	to	70	0	0
Permanganate	lb.	0	6	0	to	0	6	3
Prussiate, red	lb.	0	6	0	to	0	6	3
Prussiate, yellow	lb.	0	2	3	to	0	2	4
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt.	4	15	0	to		—	
Seconds	cwt.	4	10	0	to		—	
Sodium acetate	ton	60	0	0	to	62	0	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Sodium, Bichromate	lb.	0	1	10	to	0	1	11
Bisulphite, 60-62%	ton	42	10	0	to	45	0	0
Chlorate	lb.	0	0	5¾	to	0	0	6¼
Caustic, 70%	ton	42	10	0	to	43	10	0
Caustic, 76%	ton	44	10	0	to	45	10	0
Hydrosulphite, powder, 85%	lb.	0	3	3	to	0	3	6
Hyposulphite, commercial	ton	27	10	0	to	29	10	0
Nitrite, 96-98%	ton	115	0	0	to	120	0	0
Phosphate, crystal	ton	38	0	0	to	40	0	0
Perborate	lb.	0	2	2	to	0	2	4
Prussiate	lb.	0	1	10	to	0	1	11
Sulphide, crystals	ton	21	0	0	to	22	0	0
Sulphide, solid, 60-62%	ton	40	10	0	to	42	10	0
Sulphite, cryst.	ton	13	0	0	to	13	10	0
Strontium, carbonate	ton	85	0	0	to	90	0	0
Nitrate	ton	85	0	0	to	90	0	0
Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	25	0	0	to	27	0	0
Roll	ton	24	0	0	to	26	0	0
Tartar emetic	lb.	0	3	5	to	0	3	6
Tin perchloride, 33%	lb.	0	2	6	to	0	2	7
Perchloride, solid	lb.	0	3	0	to	0	3	3
Protochloride (tin crystals)	lb.	0	2	5	to	0	2	7
Zinc chloride, 102 Tw.	ton	24	0	0	to	26	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0
Oxide, 99%	ton	82	10	0	to	85	0	0
Oxide, 94-95%	ton	67	10	0	to	70	0	0
Dust, 90%	ton	90	0	0	to	92	10	0
Sulphate	ton	23	0	0	to	24	0	0

Coal Tar Intermediates, &c.

	per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	3	9	to	0	4	0
Alphanaphthol, refined	lb.	0	4	3	to	0	4	6
Alphanaphthylamine	lb.	0	3	6	to	0	3	9
Aniline oil, drums extra	lb.	0	1	5	to	0	1	6
Aniline salts	lb.	0	1	10	to	0	2	0
Anthracene, 85-90%	lb.		—		to		—	
Benzaldehyde (free of chlorine)	lb.	0	5	6	to	0	6	0
Benzidine, base	lb.	0	12	6	to	0	13	6
Benzidine, sulphate	lb.	0	10	0	to	0	11	0
Benzoic, acid	lb.	0	5	9	to	0	6	0
Benzoate of soda	lb.	0	5	9	to	0	6	0
Benzyl chloride, technical	lb.	0	2	3	to	0	2	6
Betanaphthol benzoate	lb.	1	6	0	to	1	7	6
Betanaphthol	lb.	0	4	9	to	0	5	0
Betanaphthylamine, technical	lb.	0	8	6	to	0	9	0
Croceine Acid, 100% basis	lb.	0	5	6	to	0	6	6
Dichlorbenzol	lb.	0	0	6	to	0	0	7
Diethylaniline	lb.	0	7	9	to	0	8	6
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	4	to	0	1	6
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	3	3	to	0	3	6
Dimethylaniline	lb.	0	4	9	to	0	5	0
Diphenylamine	lb.	0	4	6	to	0	4	9
H-Acid	lb.	0	13	6	to	0	14	0
Metaphenylenediamine	lb.	0	5	9	to	0	6	0
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	6
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthionic acid, crude	lb.	0	5	6	to	0	5	9
Naphthionate of Soda	lb.	0	6	0	to	0	6	6
Naphthylamin-di-sulphonic-acid	lb.	0	5	6	to	0	6	6
Nitronaphthaline	lb.	0	1	3	to	0	1	4
Nitrotoluol	lb.	0	1	3	to	0	1	6
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	0	to	0	1	2
Orthotoluidine	lb.	0	2	9	to	0	3	0
Orthonitrotoluol	lb.	0	1	6	to	0	1	8
Para-amidophenol, base	lb.	0	15	0	to	0	16	0
Para-amidophenol, hydrochlor	lb	0	15	6	to	0	16	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	8
Paranitraniline	lb.	0	7	6	to	0	7	9
Paranitrophenol	lb.	0	2	6	to	0	2	9
Paranitrotoluol	lb.	0	5	3	to	0	5	6
Paraphenylenediamine, distilled	lb.	0	13	6	to	0	14	6
Paratoluidine	lb.	0	7	6	to	0	8	6
Phthalic anhydride	lb.	0	9	0	to	0	10	0
R. Salt, 100% basis	lb.	0	4	0	to	0	4	2
Resorcin, technical	lb.	0	11	6	to	0	12	6
Resorcin, pure	lb.	0	17	6	to	1	0	0
Salol	lb.	0	5	9	to	0	6	0
Shaeffer acid, 100% basis	lb.	0	3	6	to	0	3	0
Sulphanilic acid, crude	lb.	0	1	9	to	0	1	10
Tolidine, base	lb.	0	10	6	to	0	11	6
Tolidine, mixture	lb.	0	3	0	to	0	3	6

The Oil Position in Russia

THE directors of Baku Consolidated Oilfields, Ltd., announce that telegraphic advices from Baku, dated the 2nd inst., show that industrial life follows its usual course, though the exploitation of the oilfields is retarded at present by the scarcity of drilling material and the lack of transport facilities. Steady progress is being made in consolidating the working of the four amalgamated companies, and the monthly production of petroleum from the old wells is maintained at about 435,000 poods, or 7,000 tons. It is considered desirable, however, that provision should now be made for development work on a scale commensurate with the magnitude and importance of the company. With this object in view large orders must be placed for drilling machinery, casing, &c., and substantial cash deposits paid in respect of such orders. Not only have the prices of all oilfield material risen enormously owing to the war, but the pressure on the resources of manufacturers entails considerable delay in obtaining deliveries. In the opinion of the directors it would be unwise to await the re-establishment of normal conditions before placing orders for the necessary machinery and plant. They state that the financial position of the undertaking is thoroughly sound, and that its properties have been uninjured by military measures or civil commotion.

A BLACKBURN KANGAROO aeroplane, which left Brough, Hull, for Amsterdam with a consignment of textile goods, returned on Saturday, March 13, with 1,200 lb. of aniline dyes, contained in small casks, consigned to a Bradford firm. This was the first trip of the proposed commercial air service between Yorkshire and Holland.

Company News

DOMINION GLASS CO.—A dividend of 1 per cent. has been declared for the common stock for the quarter ending March 31.

PREMIER OIL CO.—It is announced that the directors are in negotiation with an important financial group in Paris for the sale of the company's Galician interests.

HARRISONS & CROSFIELD.—The directors have declared a dividend on the cumulative preference shares at the rate of 6 per cent. per annum, less tax at 6s., for the three months to March 31.

LONDON NITRATE.—The directors have, at the request of several shareholders, extended the time for the acceptance of provisional allotments of new shares at £2. 10s. to the close of business on the 19th inst.

ZINC CORPORATION.—There being no immediate prospect of a resumption of operations at Broken Hill, which have been suspended since May 6 last, the directors regret that they are not in a position to declare the usual interim participating dividend on the capital of the company.

UNION COLD STORAGE CO.—Out of the 2,000,000 7 per cent. cumulative preference shares of £1 each at par, and 700,000 10 per cent, "A" cumulative preference shares of £1 each at 26s. per share to be issued (*see* THE CHEMICAL AGE, March 6, p. 265), the directors and their friends have subscribed for 500,000 of the former and 350,000 of the latter.

UNITED TURKEY RED CO.—The net profits for the past year were £121,562, after providing for excess profits duty. £25,549 was brought forward. A final dividend of 7½ per cent. and a bonus of 2½ per cent. is proposed on the ordinary shares, making 12½ per cent., free of income tax, for the 12 months, adding £30,000 to the reserve, and carrying forward £32,391.

ANGLO-PERSIAN OIL CO.—A scheme is being pushed forward involving a total outlay of £7,000,000 at Skewen, South Wales, having for its object the making of Swansea the Western distributing centre of the company. They are building large refineries, offices, houses, &c., on a large open site adjacent to the Swansea Burrows, and are constructing pipe tracks to Swansea Port, 5 miles away, through which the crude oil will be pumped direct from their own tank steamers upon arrival through to the new refineries, and then despatched again by return pipes for shipment, employing a minimum of labour in the process.

LIMMER & TRINIDAD LAKE ASPHALTE CO.—After writing off £4,905 for depreciation, the profit for 1919 amounts to £41,686. The sum of £1,000 has been written off amalgamation expenses, while the interim dividend of 5 per cent. absorbed £8,316. The directors recommend a balance dividend of 5 per cent. (less tax) on both preference and ordinary shares, and a bonus of 1s. per share (less tax) on preference shares and ordinary shares issued at January 1, 1919, and a bonus of 9d. per share (less tax) on ordinary shares issued in April, 1919, and an addition to general reserve fund of £3,000, carrying forward £13,470, subject to excess profits duty, not yet ascertained.

HOME GROWN SUGAR, LTD.—The company has an authorised share capital of £1,000,000 in ordinary shares of £1 each, of which 500,000 shares are issued and 250,000 offered at par. His Majesty's Government has agreed forthwith, upon the company becoming entitled to commence business, to subscribe for a number of ordinary shares (not exceeding 250,000), equivalent to the number allotted to public subscribers. Out of the 250,000 shares offered, the directors and other members of the British Sugar Beet Growers' Society have applied for 125,000. A dividend of 5 per cent. per annum on the capital subscribed by the public up to 250,000 shares is guaranteed by the Government for the period ending March 31, 1930.

BRADFORD DYERS ASSOCIATION.—At a special meeting on Monday it was resolved that the bonus to be paid on the ordinary shares held by the workpeople shall be the same as the dividend on those held by the public, provided that the latter is not less than 5 per cent. At present, when the dividend is under 5 per cent. on the ordinary shares the bonus shares receive nil, when it is 5 per cent. they receive 2½ per cent., 6 per cent. 3 per cent., and so on in proportion. It was also resolved that, in view of the rise in the cost of living, and the consequent increase of wages, the limit of remuneration to enable employees to purchase preference shares for the purpose of having them placed on the register should be raised from £250 to £500.

BRITISH ALUMINIUM.—At an extraordinary general meeting held on Monday, resolutions were carried altering the articles of association. A further meeting is to be held on March 30, at which further resolutions will be submitted to increase the capital to £1,500,000 by the creation of 500,000 ordinary shares of £1 each, and to capitalise £400,414 of the reserve account and to allot two fully-paid ordinary shares for every three ordinary shares held on March 15, such new shares to rank for dividend as from January 1, 1920. The profit for 1919, including the amount brought forward is £193,764. After providing for preference dividend, the directors recommend a further dividend at the rate of 12 per cent. per annum on the ordinary shares, making 10 per cent. for the year, carrying forward £15,314.

BENZOL MANUFACTURERS, LTD.—At an adjourned extraordinary general meeting held recently a resolution was carried for the sale of Mitcham Benzol Refinery for 60,000 ordinary shares in Benzol & By-Products, Ltd. General Sir B. Blood, G.C.B., who presided, said that Benzol & By-Products, Ltd., would be incorporated primarily to acquire, amalgamate and extend their Mitcham Benzol Refinery and Crigglestone Colliery and coke-oven works near Wakefield, the latter being large producers of raw material used at their refinery (crude benzol), which was obtained as a by-product from slack or small coal of their own colliery. The capital of Benzol & By-Products, Ltd., would be £700,000, divided into 350,000 ordinary shares and 350,000 10 per cent. cumulative preference shares, convertible into ordinary shares free of cost by notice to the company, after allotment, any time before January 1, 1922, the holder of each preference share having this right, and every share, preference or ordinary, carried a vote.

ANGLO-AMERICAN OIL CO.—The Anglo-American Oil Co. have made arrangements for extensive developments in this country. A large number of petrol bulk-storage depots are being constructed to receive petrol by railway tank-cars and distribute it in bulk. They are also establishing ocean installations at the seaboard for receiving and handling produce brought by tank steamers. One big place is being erected at Port Ellesmere, near Runcorn, on the Manchester Ship Canal, and another on the Humber, near Hull. Another large installation for the storage of liquid fuel for bunkering steamers is being completed at Brixham, on the Devonshire coast, and there are hundreds of other undertakings of this kind, large and small, which were hung up on account of the war, and all of which are needed now to give facilities for coping with the greatly increased consumption. Contracts are being placed all over the country for storage tanks, and the building programme of the company stands at between two and three millions sterling.

Lever Brothers Annual Meeting

LORD LEVERHULME (chairman of the company), at the annual general meeting held last week, referred to the progress made by the company during the past year, both at home and abroad. The Brussels works he said, had been restored and were in full operation. At Lille the Germans had stripped the works of all plant and machinery, which had been very difficult to replace, but they would be opened in May. The German works owned before the war were still in the hands of the enemy, and it was difficult to say whether they would be restored or not.

With regard to foreign trade, it would be seen from a recent report of a Committee on profiteering, dealing with a thread firm, that had the thread firm taken their profits from the export trade they could lower the price in the United Kingdom. That equally applied to Lever Brothers. If they took greater profit in the export side of the business they could lower the price of soap in the United Kingdom; but it was impossible, as any business man knew. If there were two price lists, one for the United Kingdom and another for the export, the one that was the lower of these would be the one list that both the home and export buyers would buy from. He was sure everybody realised that except the profiteering committee. By recent correspondence they were held up to great odium for an order that was taken for 1,400 cases of soap which was diverted to the export trade. He did not know whether the gentleman who made that criticism made it with the knowledge that under Government approval and permit the export trade of soap in the United Kingdom last year totalled £7,000,000 for laundry soap, and close upon £1,500,000 for toilet soap, a total of £8,500,000, while this particular order that was held up as a villainous act was for £3,000. It was impossible if they were to maintain the trade of the United Kingdom that they should not make soap for the foreigner. But all this was done out of the raw materials available, and they had always maintained the supply necessary for the home trade, and the surplus only had been exported.

The company had been planting cocoanuts at the Solomon Islands and rearing cattle there for years, and they had had largely increased profits. The Belgian Congo was making handsome profits, and continued to make greater profits each succeeding year. Omitting the war period, this result had been achieved in much less time than was anticipated when they undertook the work in that country.

With reference to margarine, there was at present a very severe competition. They were having to draw on other more profitable departments of the business to make good the losses on margarine. This competition was the natural result of the disturbance of the relationship of certain firms by Government control during the war. They had no fear from it. The supply of raw materials was drawn from West Africa and from all parts of the world first hand, and whilst the books were kept so that each department of the business did not lean on any other department, still they were able to look with perfect calmness for very many years, if necessary, to the present competition in the margarine trade.

In conclusion, Lord Leverhulme forecasted that the profits for 1920—which included the profits of those associated companies acquired during the last 12 months, viz., Messrs. Crossfield, Gossage's, Price's, Knight's, the Niger Company, the Southern Whaling Company—would total approximately 3¾ millions, and they would require to decide next year how to deal with this matter. These would have been due to the enormously increased volume of business and the larger service they were rendering to the public.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Receiving Order

OGDEN, ARTHUR EDWIN, 58, Dalton Road, Barrow-in-Furness, chemist, &c. March 8. First meeting, March 26, 11.30 a.m., Official Receiver's Office, 16, Cornwallis Street, Barrow-in-Furness. Public examination, March 31, 3 p.m., Magistrates' Court, Barrow-in-Furness.

Companies Winding Up Voluntarily

ANGLO-CARIBBEAN PETROLEUM SYNDICATE, LTD.—Meeting of creditors at 13, Copthall Court, E.C. 2, on March 26, at 3 p.m. Malcolm Brodie, Liquidator.

ARTHUR DUCKHAM & CO., LTD.—Liquidator, Sir William Jones.

BRITISH CELLULOSE & CHEMICAL MANUFACTURING CO., LTD (in voluntary liquidation)—Meeting of creditors will be held at 8, Waterloo Place, London, S.W. 1, on March 26, at 2.45 p.m.

BRITISH CHEMICAL PLUMBERS SUPPLY, LTD. (in voluntery liquidation).—A general meeting of members will be held at 2, Curzon Street, Burton-on-Trent, on Friday, April 23, at 12 noon. William Gamble, Liquidator.

DROITWICH SALT CO., LTD.—A meeting of creditors will be held at 24, North John Street, Liverpool, on Monday, March 22, at 12 noon. C. Hewetson Nelson, Liquidator.

LONDON LUBRICANTS, LTD. (winding up voluntarily for the purpose of amalgamation).—Meeting of creditors at 28, Bolton Street, Piccadilly, on Saturday, March 27, at 11 a.m. A. D. Sanderson and G. W. Spencer, Liquidators.

MELBUR CHINA CLAY CO., LTD. (winding up voluntarily for reconstruction purposes).—Meeting of creditors at the offices of Reeve, Parker & Co., 2, Coleman Street, E.C. 2, on Wednesday, March 24, at 12 noon. Creditors' claims on or before March 31, to the Liquidator, A. G. Parker, at the above address. All creditors of the company have been or will be paid in full, and this meeting is being held solely to comply with the requirement of the Companies Acts.

MIDLAND CHEMICAL CO., LTD. (in voluntary liquidation).—A meeting of creditors will be held at the offices of Paterson, Brodie & Co., Lloyds Bank Chambers, Burslem, at 3 p.m., on March 22. Creditors' claims on or before April 22 to H. H. Brook, Lloyds Bank Chambers, Burslem, Liquidator.

OILS & GREASES, LTD. (winding up voluntarily for the purpose of amalgamation).—Meeting of creditors at 28, Bolton Street, Piccadilly, on Saturday, March 27, at 11 a.m. A. D. Sanderson and G. W. Spencer, Liquidators.

OLEINE, LTD. (in voluntary liquidation for the purposes of reconstruction).—A meeting of creditors will be held at the offices of Kidsons, Taylor & Co., 1, Booth Street, Manchester, on Tuesday, March 30, at 12 noon. Vaudrey, Osborne & Mellor, 30, St. Ann Street, Manchester, Solicitors for Leonard Douglas Kidson, Liquidator.

PERRY-WAYNE OIL CO., LTD.—A meeting of creditors will be held at 20, Lawrence Lane, London, on Wednesday, March 24, at 12 noon. G. Thompson, Liquidator.

WOODALL, DUCKHAM & JONES, LTD.—Liquidator, Sir William Jones.

Liquidators' Notices

OXYGEN, LTD.—Meeting of creditors, March 30, 3 p.m.; general meeting, April 28, 3 p.m., both at Elverton Street, Westminster. Creditors' claims on or before March 25, to F. Leeds, Liquidator, at the above address.

YORKSHIRE GREASE & FERTILISER CO., LTD. (in voluntary liquidation for the purposes of reconstruction).—A meeting of creditors will be held at the offices of Kidsons, Taylor & Co., 1, Booth Street, Manchester, on Tuesday, March 30, at 12 noon. Vaudrey, Osborne & Mellor, 30, St. Ann Street, Manchester, Solicitors for Leonard Douglas Kidson, the Liquidator.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.*]

NATIONAL CHEMICAL WORKS, LTD., WATFORD.—Registered February 21, £23,000 mortgage (also secured by a series of debentures for the same amount), to Copleys Bank, Ltd.; charged on land and buildings at Watford, and all fixed plant and machinery, also general charge. *£5,000. September 9, 1919.

County Court Judgments

NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

WYLIE, ROBERT THOMAS, 7, High Street, High Wycombe, chemist. £11. 17s. 10d. February 6.

CAMERON, W. R., 198, Union Road, Oswaldtwistle, chemist. £14. 11s. 9d. February 11.

DYBALL, T. W., Christchurch Street, Ipswich, chemist. £22. 2s. 6d. February 12.

ROGERS DRUG STORES, 2, Watery Lane, Birmingham, chemists. £11. 17s. February 10.

INMAN, LESLIE D., 41, Dragon Parade, Harrogate, chemist. £26. 3s. 3d. February 9.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.:—

ANGLO-CZECHO-SLOVAK OIL SYNDICATE, LTD., 13, Copthall Court, E.C. 2.—To acquire lands and search for petroleum oils or natural gas. Nominal capital, £20,000 in 20,000 ordinary shares of £1 each and 200 deferred shares of 1s. each. Directors to be appointed by subscribers. Qualification of Directors, £100 or 10 deferred shares.

ANGLO-DOMINION PETROLEUM CO., LTD.—To search for oils, shale, minerals, wax and gas. Nominal Capital £100,000 in 100,000 shares of £1 each. Minimum subscription, 7 shares. Directors to be appointed by subscribers. Qualification of Directors, £25. Subscribers: H. Pellitt, 18, Austin Friars E.C.; L. H. Hiscock, 18, Austin Friars, E.C.; R. H. Box, 18 Austin Friars, E.C., and four others.

ARGOSY INVESTMENT TRUST, LTD.—To acquire petroleum or oil-bearing lands. Nominal capital, £20,000 in 30,000 shares of 5s. each. Minimum subscriptuon, 7 shares. Directors to be appointed by subscribers. Qualification of Directors, £100. Remuneration of Directors, £100 each; Chairman, £125. Subscribers: W. H. Butterfield, 17, New Road, Crouch End, N. 8; H. F. Perry, 8, Park Grove Road, Leytonstone, E., and three others.

ASEPLENE, LTD., 33, Bedford Street, Strand, W.C.—To acquire the trade mark "Aseplene" and carry on the business of chemists and druggists. Nominal Capital, £5,000 in 5,000 shares of £1 each. Directors: J. G. Sparkhall, 10, Hartell Road, Dulwich, S.E. Qualification of directors, 100 shares.

BENZOL & BY-PRODUCTS, LTD.—Drysalters, manufacturers, distillers and merchants of tar, oil, benzol and other products. Nominal Capital, £700,000 in 350,000 cumulative convertible preference shares of £1 each, and 350,000 ordinary shares of £1 each. Minimum subscription, 7 shares. Directors: S. H. O. Box-Ironside, 23, Grosvenor Place, S.W.1; the Earl of Drogheda, 40, Wilton Crescent, S.W.1; A. A. Roberts, 17, Victoria Street, S.W.1; E. S. Shrapnell-Smith, Hound House, Shere, Surrey; E. C. Fairweather, Avisford Park, Sussex. Qualification of Directors, £2,000; remuneration of Directors, £300 each; Chairman, £400.

BRITISH SINAI PETROLEUM CO., LTD., 6, Queen Street Place, E.C. 4.—To acquire oil, petroleum and mineral-bearing lands. Nominal Capital, £500,000 in 500,000 shares of £1 each. Minimum subscription, 7 shares. Directors to be appointed by subscribers. Qualification of Directors, £200. Remuneration of Directors, £150 each; Chairman, £250.

BRITISH OIL & FUEL CONSERVATION, LTD., 47, Victoria Street, Westminster.—To acquire patents, any invention or process in relation to the carbonisation or distillation of coal, shale or other substances. Nominal Capital, £150,000 in 120,000 participating preference shares of £1 each, and 600,000 deferred shares of 1s. each. Minimum subscription, £7 Directors: T. C. Probert, "Troedyrtriw," Ystradmyrach, near Cardiff; R. H. Lees, 55, Penarth Road, Cardiff; N. H. Freeman, 80, New Cavendish Street, W. 1. Qualification of Directors, £100 in preference shares. Remuneration of Directors, £250; Chairman, £350.

BROWN (ARTHUR) & CO., LTD., 126, Bishopsgate Street, E.C.—To acquire and carry on the business of oil and produce brokers. Nominal Capital, £75,000 in 75,000 shares of £1 each. Directors to be appointed by subscribers.

COLLINS (F.), LTD., 69, Corporation Street, Manchester.—Chemical and general merchants. Nominal Capital, £5,000 in

5,000 shares of £1 each. Directors: F. Collins, Aston House, Prestwich Park, Manchester (Managing Director); Martha A. Collins, Aston House, Prestwich Park, Manchester. Qualification of Directors, £100; Managing Director, 500 shares. Remuneration of Directors to be voted by Company in General Meeting; Managing Director, £750.

COLONIAL & FOREIGN GLASS INDUSTRIES, LTD., 6, Austin Friars, E.C. 2.—Glass manufacturers. Nominal Capital, £750,000 in 750,000 shares of £1 each. Minimum subscription, £7. Directors: C. C. Hatry, 56, Upper Brook Street, W.; J. Mitchell, 37, Avenue Road, N.W. 8; T. B. Kitson, 72, Albion Street, Leeds; G. Owry, Holwood House, Walton-on-Thames. Qualification of Directors, £500. Remuneration of Directors, £400 each; Chairman, £500.

DIVE (E. B.) & CO., LTD., 46, Old Gravel Lane, Wapping, E. 1.—Manufacturing Chemists. Nominal Capital, £30,000 in 30,000 shares of £1 each. Directors: G. J. Kemball, E. Kemball, S. J. Kemball. Qualification of Directors, 500 shares. Remuneration of Directors, G. J. Kemball, £600; E. Kemball, £400, S. J. Kemball, £300.

ENGLAND, HUGHES, BELL & CO., LTD., Station Road, Padgate, near Warrington. Chemical, paint, varnish, cements, &c., manufacturers. Directors: E. England, Walden, Fearnhead, near Warrington; W. Payne, 2, West Smithfield, E.C.; J. W. Hughes, 14, Bedford Street, Stockton Heath, near Warrington; F. Bell, 10, Brackley Street, Stockton Heath, near Warrington. Qualification of Directors, 100 shares. Remuneration of Directors, £100 each.

GRAESSER-MONSANTO CHEMICAL WORKS, LTD.—Manufacturing Chemists. Nominal Capital, £400,000 in 400,000 shares of £1 each. Directors to be appointed by subscribers. Qualification of Directors, 100 ordinary shares. Subscribers: P. D. Thomas, 1, Bush Lane, E.C.; Majorie Perry, 44, Dalglesian Street, Limehouse, E. 14.

KEIGHLEY LABORATORIES, LTD., Croft House, South Street, Keighley, Yorks.—Metallurgical, general and commercial analysts. Nominal capital, £5,000 in 4,000 ordinary shares of £1 and 1,000 founders' shares of £1 each. Directors: Sir H. Smith, K.B.E., Yew Bank, Keighley; W. Slingsby, Highfield Villa, Keighley; W. H. Poole, 31, Queen's Road, Bradford. Qualification of Directors, £100.

LACKLAND & CO. LTD., 21, Tempest Hey, Liverpool.—Glass merchants. Nominal Capital, £5,000 in 5,000 ordinary shares of £1 each. Directors: Helen A. Watson, 17, Alexandra Road, Waterloo, near Liverpool; Amy Watson, 17, Alexandra Road, Waterloo, near Liverpool; A. Stott, 16, Lynwood Road, Nice Lane, Waterloo, near Liverpool; and four others. Qualification of Directors, 1 share.

MAWSON (JOHN W.) & CO., LTD., 142, Norwood Road, West Norwood, S.E.27.—Wholesale and export manufacturing chemists. Nominal Capital, £4,000 in 4,000 shares of £1 each. Directors: J. W. Mawson, F. Ritson (permanent Directors). Qualification of Directors, £100. Remuneration of Directors, £1. 1s. each meeting.

NEWFOUNDLAND OIL PRODUCING CO., LTD.—11, Queen Victoria Street, E.C.—Nominal Capital, £50,000 in 50,000 ordinary shares of £1 each. Minimum subscription, £7. Directors: J. Robinson, 218, Bath Road, Hounslow; T. Hicks, Tratsford Farm, Borden, Hants. Qualification of Directors, 1 share. Remuneration of Directors, £100 each; Chairman, £150.

OILS & OILSEED BROKERS ASSOCIATION, LTD., 50, Gresham Street, E.C.—To protect the interests of brokers engaged in the oil and oilseed trade. Every member to contribute a sum not exceeding £5 if necessary. Directors: R. J. Bayley, 20, Alexandra Court, Queen's Gate, W.; W. H. Carver, The Croft, North Cave, Brough, East Yorks; T. H. Cookson, Gateacre House, Gateacre, Liverpool; and six others.

OLEINE, LTD., 13, Bond Street, Leeds.—Oil distillers and refiners, &c. Nominal Capital, £50,000 in 50,000 shares of £1 each. Directors: S. W. Meyer, Wells House Hotel, Ilkley; S. B Meyer, 15, Virginia Road, Leeds; H. Lant, Ivy Bank, Wath-on-Dearne, Yorkshire; G. H. Lant, Ivy Bank, Wath-on-Dearne, Yorkshire. Qualification of Directors, 100 shares.

PREMIER GLASS MANUFACTURING CO., LTD., Osborne House, Lee Green, S.E.13.—Manufacturers and dealers in glass, &c. Nominal Capital, £5,000 in 4,000 ordinary shares, and 1,000 preference shares of £1 each. Directors: C. H. Tholm, 120, Tulse Hill, S.W.2; A. Respinger, 46, Queen's Gardens, Lancaster Gate, W.2. Qualification of Directors, 1 share.

WAREING, JNO. W., SONS & CO., LTD.—Manufacturers of oil and grease, oil fats, &c. Nominal Capital, £5,000 on 5,000 ordinary shares of £1 each. Directors: A. W. Wareing, The Cottage, Rainhill Road, S. Helens; J. W. Wareing, Mill Lane, Bold, Widnes (permanent directors). Qualification of Directors, £500. Remuneration of permanent directors, £250.

VAR OIL & COAL CO., LTD., Pinners' Hall, Austin Friars, E.C.—To acquire and hold shares, stocks and debentures, &c. Nominal Capital, £750,000 in 750,000 shares of £1 each. Minimum subscription 7 shares. Qualification of Directors, 500 shares. Remuneration of Directors, £200 each; Chairman, £400.

Aluminium Welding

On Thursday week, in the Chancery Division, Mr. Justice Sargent resumed the hearing of the action by the Aktien Gesellschaft für Autogene Aluminium Schweissung against the London Aluminium Co., Ltd., of Birmingham, for an injunction respecting aluminium welding fluxes (see THE CHEMICAL AGE, March 13, p. 281).

Mr. Horatio Ballantyne described what happened at the demonstration before his lordship on Wednesday afternoon. Six welds were made, and a strip of aluminium was used as a welding-stick. The aluminium plates were ⅛ in. and 1/16 in. in thickness, and the fluxes were applied as powder and aqueous solutions. One flux was tried for the first time—viz., one made with sodium fluoride. The welder had said he preferred the aqueous flux, from which he (Mr. Ballantyne) presumed that it was the most successful. The welded plates were exhibited.

Mr. Hunter Gray, K.C. (for the defendants), continued his cross-examination, the greater part of the day being occupied with the examination of a number of aluminium plates which had been welded for the purpose of the defence.

On Friday, Mr. Sidney Arthur Smith, works manager for Mr. John Dore, of Bromley, said they welded aluminium under licence from the plaintiffs between 1910 and 1914. He did not know of what the fluxes were composed. Their operator was instructed by a Swiss. The use of aluminium for vessels had very much increased of late years, so much so as to come into active competition with copper vessels, which was the work in which his firm was mainly engaged.

Mr. Ashley Iles, foreman of the Lancashire & Yorkshire Railway Co.'s steel metal works, said he first welded aluminium in 1912, when he used a commercial flux. At that time it was to him a new art. He did not think it was possible to weld aluminium without a flux. He had tried many times with a blow-pipe and failed. Puddling did not make a satisfactory joint. Welding with a flux was a very skilful operation in his opinion. He had seen an iron welder fail completely when put on to aluminium. It also required more skill than lead burning.

Mr. Ballantyne then resumed his place in the witness-box for the third day, and was re-examined upon the question of prior publication.

On Tuesday evidence was given by a Mr. Restall and Dr. Passmore, the former giving details of welding of aluminium sheets which he performed. Dr. Passmore continued his evidence on Wednesday after welding experiments had been carried out in one of the consulting rooms attached to the Court, at which the judge was present. The evidence was of a highly technical and detailed character. The hearing was again adjourned.

Aniline Dyes and Chemical Co.'s Claim for Soap

In the King's Bench Division last week, Mr. Justice Darling had before him an action by the Aniline Dye & Chemical Co., Ltd., of Lucy Street, Hulme, Manchester, against Reginald Godfrey & Co., of Bush Lane House, Cannon Street, London, E.C., general merchants, to recover the sum of £715 and interest.

Mr. Scot, for the plaintiff, said the defendants were sued as the acceptors of a bill of exchange. The defendants, in reply, said that they bought from the plaintiffs 11 tons of soap at £65 a ton, to be delivered to the Port of Manchester warehouses. The defendants admitted the acceptance of the bill, and said that the plaintiff did not deliver the goods or any part of them. The defendants replied that 10 tons out of 11 tons were in fact delivered by being put on the s.s. "Cormorant" for shipment, and that defendants accepted delivery in that way. The plaintiffs were willing to give credit for the 1 ton of soap not delivered.

Mr. Morris, for the defendants, said his case was that the consideration for the bill totally failed, as the plaintiffs had not delivered the goods.

At this point a settlement was arrived at, and it was agreed that the claim and counterclaim should be dismissed, with no order as to costs.

His Lordship: This is what they call in the army a wash out. (Laughter.)

Action by Research Chemist

On Wednesday, in the King's Bench Division, Mr. Justice Coleridge commenced the hearing of an action by Mr. G. Edward Heyl, a research chemist and chemical engineer, against his trustee in bankruptcy, Mr. Soloman, and a number of others, to set aside three agreements on the ground of alleged misrepresentations.

The agreements which were attacked were made in September and December, 1918, and were in fact agreements, said plaintiff's counsel, entered into as the result of a compromise of a very elaborate action which was brought in connection with plaintiff's business. The case was of an involved character.

His lordship found that the plaintiff had not made out his case and gave judgment for the defendant.

Yorkshire Firm's Claim

In the King's Bench Division on Thursday week, before Mr. Justice Coleridge, an action was brought by L. B. Holliday & Co., Ltd., Huddersfield, against May & Baker, Ltd., of Battersea, London, to recover the price of 1 ton of salicylic acid sold to the defendants, who, in reply, said they were not bound to accept the goods, and claimed to set off £280. 6s. 6d. for goods sold by them to the plaintiffs.

Mr. Lowenthal, for the plaintiffs, said they did not dispute the £280. 6s. 6d., and had given credit for that sum, and therefore, if plaintiffs were right they would be entitled to £195 13s. 6d.

The circumstances were that plaintiff sold 2 tons in September, 1918, for delivery in the following October. The plaintiffs were engaged in the manufacture of picric acid and apparently nothing was done as to the order till November 27, when there was correspondence about the sample. In January, 1919, 1 ton was delivered and paid for by defendants. Of course, the time for delivery had really passed, but defendants did not take that point, and counsel's case was that the contract for delivery in October was replaced by a contract for delivery within a reasonable time. The second ton was delivered subsequently, but the defendants then said they could not be expected to accept after so much delay.

For the plaintiffs' case evidence was given that the plaintiffs were under Government control still in the latter part of 1918, and there were great difficulties in getting packers and packages, and in securing transit. The goods were sent off as soon as possible, after the sample had been passed.

For the defendants Mr. Leck, K.C., submitted that the new contract was made in December, 1918, for speedy delivery which meant that the sellers must be in a position to make immediate deliveries.

Mr. Justice Coleridge decided that there was such delay on the part of the plaintiffs, that the defendants were entitled to repudiate. He gave judgment for the defendant on claim and counterclaim, with costs.

Benn Brothers Journals

Some Features of the Current Issues

Aeronautics.

"Flying over Clouds"; and "The Government's Attitude to Aviation."

The Cabinet Maker.

"Practical Upholstering: Buttoned Work in Leather"; "Profit Sharing and Co-Partnership by Limited Companies"; and "A Day's Work."

The Electrician.

"The Localisation of High Resistance Breaks in Submarine Cables," by A. Poulsen; Abstract of Paper read before the Institution of Electrical Engineers on "Direction and Position Finding in Wireless Telegraphy," by Capt. H. J. Round; and description of electrical apparatus exhibited at Olympia.

The Fruit-Grower.

"Commercial Rose Growing: No. 3"; "London Market Problem"; and "A Trade Charity's Record."

The Gas World.

"The Place of Gas in the New Housing Schemes"; "The Use of Gas in Industry"; and "Unsolved Problems of the Gas Engine."

The Hardware Trade Journal.

"Gas in Relation to Industrial Production and National Economy"; Institute of Metals: Presidential Address and Papers; and the London Fair and Market.

Ways and Means.

"England Under Socialism," by the Editor; "Juvenile Employment," by W. Henderson Pringle; "Southern Russia," by Miss Evelyn Miller.